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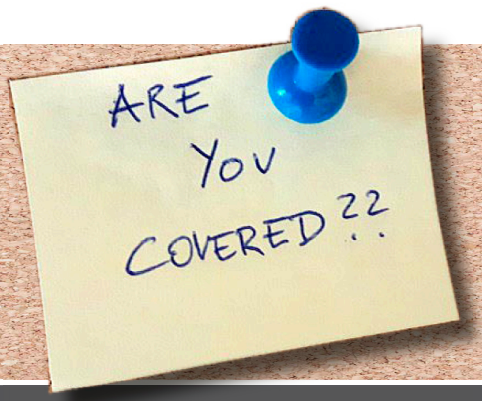
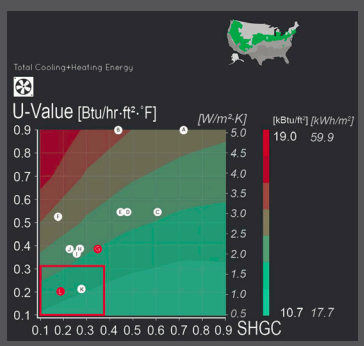
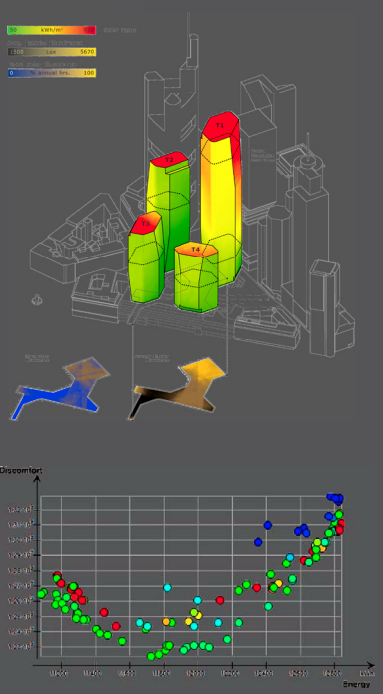


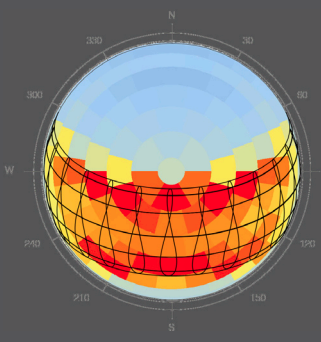
Simulation, risk and indemnity: part 2

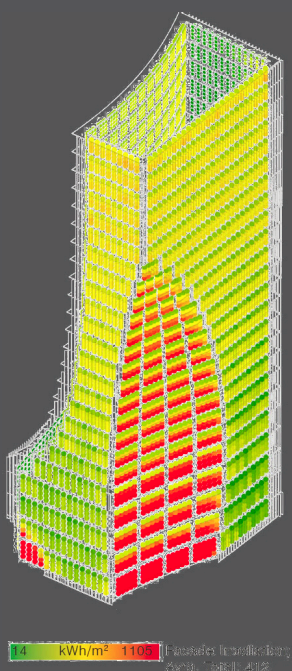
Views from two experienced practitioners - what's yours?

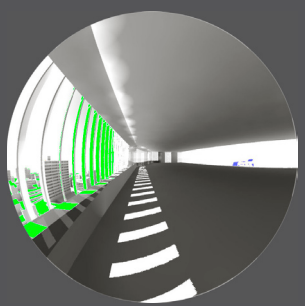
Summarising complex simulation results and communicating them to architects is a challenge consultants and software designers are increasingly having to face, and a recurrent theme in this issue











OPINION PIECES on *Women & men in simulation* and on *Simulation risk & indemnity*

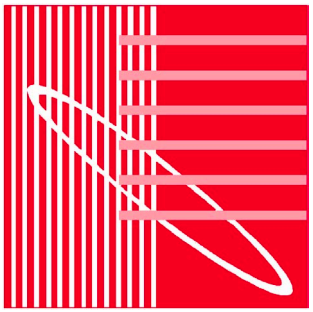
FEATURE ARTICLE Apparent Optima: Building performance simulation in early-stage architectural design

SOFTWARE NEWS about EQUA's IDA ICE, DesignBuilder, Climate.OneBuilding.org, IEA EBC Annex 60, BIM HVACTool, Project StaSIO, IES and PHPP

GLOBAL COMMUNITY NEWS from IBPSA affiliates in France, India, Ireland, the Nordic countries, Switzerland, Turkey & the USA

CALENDAR OF EVENTS 15 conferences and other events for your diary

The newsletter of the International Building Performance Simulation Association ISSN 1993-8586



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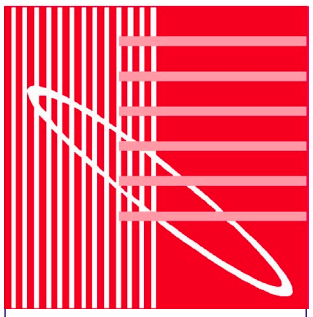
Did you know

*that the page layout and typography of ibpsa*NEWS *have been specifically designed for reading on-screen ever since volume 10 in 1999, and all the items in contents lists, and web and email addresses, are active links? Try it on your tablet! - Editor*



President's message

Dear IBPSA Colleagues and Friends,

This is my seventh and final Message as President. IBPSA officers are selected by Board members and a new slate will be named in September after the 2018 election (see below). It is a good point to assess how we have done over the past 3 years.

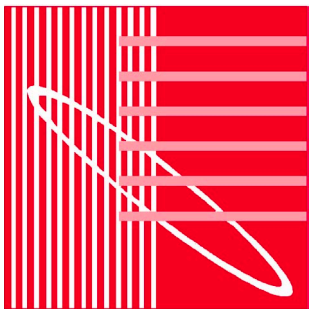
My first message (April 2015) highlighted on-going activities that IBPSA does well: Building Simulation conferences, the Journal of Building Performance Simulation, this newsletter, and our internet presence (**www.ibpsa.org**) are examples. Those have continued. Building Simulation 2015 and 2017 were both highly successful, based on delegate surveys and paper quality. The Journal's rising impact factor and expanded page count confirm its place as the leading publication in our field.

The 2015 message went on to ask, "What's next?". What initiatives should be undertaken to grow and strengthen the organization? Many ideas have been discussed in Board and committee meetings. Of these, two have made notable progress:

- **Educational webinars** — The IBPSA University YouTube channel is operational and hosts 15 freely available presentations about many aspects of building simulation. The webinars are based on chapters in the IBPSA book Building Performance Simulation for Design and Operation edited by Jan Hensen and Roberto Lamberts. See **https://www.youtube.com/channel/UCY9AD4H9_xKjKRTEvkce_8g**.
- **Projects** — IBPSA has created structures for convening collaborative projects. Project 1 (BIM/GIS and Modelica Framework for Building and Community Energy System Design and Operation) kicked off at Building Simulation 2017 and recently held an expert meeting in Berlin attended by 60 people. Full information is found at **https://ibpsa.github.io/project1/**. Project 2 will address modeler certification and is in organizational stages.

Other initiatives that the Board has identified as important have not yet achieved much traction –

- **Equality/inclusivity** — Assess the systemic barriers that limit who participates in our field. Develop strategies such as mentoring to overcome those limits.
- **Practitioner publication** — Create a practice-oriented journal to present case studies, techniques, and other material of interest to practicing modelers.
- **Improved administrative systems** — Set up membership and other systems to allow IBPSA to operate more efficiently.
- **Fundraising/development** — Explore sources of funding that could allow IBPSA to accelerate new pursuits.



As I have discussed before, these and other good ideas have languished due to our limitations as a volunteer organization. Given the expected growth of the field, IBPSA will have to find ways to support a higher level of activity. That was the challenge in 2015 and it remains so today.

Some final notes:

- **New IBPSA book** — IBPSA's second approved book, *Building Performance Analysis* by Pieter de Wilde (IBPSA Secretary) will be available in June.
- **Conferences** — All Building Simulation 2017 papers are available on-line at **www.ibpsa.org/?page_id=292**. For 2018, several regional affiliates are hosting conferences – see Forthcoming Events on page 22 for more information. I hope that you can participate in your region. In addition, a reminder that Building Simulation 2019 will convene September 2 – 4, 2019 in Rome. The call for abstracts will be circulated soon.
- **Elections** — IBPSA Board of Director elections will be held during June and July, please see page 49 for more information and watch for your email ballot. The Annual General Meeting of IBPSA will be held on September 7, 2018, followed by a meeting of the incoming Board. All IBPSA meetings are open and you are encouraged to attend. Full details will be publicized on **www.ibpsa.org**.

It has been a privilege to serve as IBPSA President.

The President's reflections on BS 2017

As reported in the last edition of *ibpsa*NEWS, Building Simulation 2017 in San Francisco was a great success. More than 770 delegates attended, making BS 2017 IBPSA's largest conference to date. Two keynotes, four provocations, more than 100 technical sessions, awards, competitions results, receptions, a banquet, posters, workshops, committee meetings, and vendor exhibits … a good time was had by all. Thanks once again go to the generous sponsors who supported the conference and thus IBPSA (there's a full list at **www.bs2017.org/sponsors.html**).

A significant innovation at BS 2017 was that many sessions included both peer-reviewed papers and oral non-paper presentations of various types. This approach is a good fit for our field that straddles academic work and practical application. Case studies, panel discussions, and preliminary reports are timely and useful, but they are not suitable for inclusion in archival conference proceedings. The mixed-session approach provides flexibility as to what gets presented and fosters practitioner/academic interchange. The response to this format was overwhelmingly positive, based on delegate survey responses. I hope that future Building Simulation conferences retain the approach.

Other new features that debuted at BS 2017:

- Recordings of presentation slides and audio, now posted for viewing via **www.ibpsa.us/news/recorded-sessions-building-simulation-2017-are-now-available**
- A mobile device app that provided session and other information to delegates. This supplemented the printed program, with the advantage that last-minute information could be included.

Because of the availability of non-paper presentation formats, the criteria for peer-reviewed papers were tightened. The page limit was increased to 10 (formerly 8) and more revisions were requested. The result is that more than 330 high-quality papers have been added to IBPSA's proceedings collection. All papers are publicly available via **www.ibpsa.org**. In addition, the authors of 16 papers have been invited to expand their contributions for submission to the Journal of Building Performance Simulation.

Another BS 2017 development was an emerging focus on the building modeling community as people and as a workforce. There were discussions about bringing new people into the field, equality issues, mentoring, and expanding international collaboration. The IBPSA Board approved a project on accreditation and formed a committee on inclusivity. Historically, IBPSA has addressed the domain of building performance simulation – what to model and how to model those things. These new initiatives recognize that IBPSA's purpose includes supporting the people working in the field, a sign of maturation of our organization. If you would like to contribute in these areas (or any aspect of IBPSA, for that matter), please get in touch with me – we are always looking for people to join committees.

Looking ahead, 2018 will be a year of regional conferences, including eSim, SimBuild, BauSIM, BSO, and ASim. Please support your local affiliate by submitting papers and attending. As usual, the papers from regional conferences will be available through **www.ibpsa.org**, so your work will benefit from worldwide visibility.

It is also not too soon to start thinking about BS 2019, to be held September 2 – 4, 2019 in Rome. Abstract submission deadlines will be upon us in less than a year. IBPSA-Italy has planning activities well underway.

Best wishes for successful modeling!

WARNING: Predatory Building Simulation conferences!

Recently, the Board of IBPSA has noted that there is a call for papers for an International Conference on Building Simulation, to take place in Rome in January 2019. This is **NOT** the IBPSA Building Simulation 2019 conference: that will take place on 2-4 September 2019. The host of the January event is known to be a predatory conference host and publisher.

Predatory conferences and publications are a relatively new phenomenon that take advantage of the pressure on academics and research students to publish widely. They use conference and journal names that are closely related to existing events and publications. They may even have an online submission system, and come back with some perfunctory review results. However, their key objective is to capture a registration or publication fee. In the end, the unsuspecting 'delegate' may end up travelling to a foreign country only to find out that he or she is alone in an otherwise empty hotel venue. Research students are a high-risk group, as they may not note irregularities in submission and review processes and other clues that an event is not right.

Unfortunately, it is almost impossible to stop predatory organizations from capitalizing on the good name of existing conferences or journals. The best protection is to make sure our community is aware of the phenomenon and to spread the word. For Building Simulation 2019, make sure to follow the official announcements via IBPSA and do not allow yourself to be side-tracked by a similar name and location.

Genuine IBPSA publications

The publication of genuine IBPSA conference and journal papers is overseen by the IBPSA Publications committee, which reports to the IBPSA Board. Conference papers are published biennially following the International Building Simulation conference which meets at various locations around the world. All these papers are published online and accessible from the main IBPSA website. At the time or writing, we are finalising arrangements for all papers to be assigned a DOI and all conference proceedings to have their own ISSN. In the years between the international conferences, many of our regional affiliates organise their own building simulation conferences. These are recognised by IBPSA and any resulting papers can be hosted on our main website. Journal papers can be submitted for consideration for publication in our International Journal of Building Performance Simulation published by Taylor and Francis (**www.tandfonline.com/loi/tbps20**). This is a world-leading journal outlet for papers in our discipline and there is a rigorous review process in place. Members of our IBPSA Board and wider membership form an international editorial board. ■

Women and men in simulation

Erik Kolderup, President, IBPSA-USA, erik@kolderupconsulting.com

Hi, I'm the white middle-aged male president of IBPSA's US affiliate. With one notable exception (hooray for Shanta Tucker) I fit the typical demographic for the position.

Issues faced by women in our industry started to become clearer to me when I attended ASHRAE's Winter Conference in Chicago earlier this year (thanks, Sue Reilly!). Afterwards, I wrote a message for IBPSA-USA's January Newsletter (**www.ibpsa.us/news/presidents-message-january-2018**); here's a portion:

I joined the Women's March in Chicago, and the experience highlighted to me that I'm guilty of skewing the gender balance in our industry. I'm occupying space that should be filled by a more talented female human. And I'm reminded of the gender imbalance at nearly every meeting I attend. I feel a stab of guilt. Your 14-member IBPSA-USA board of directors includes only three brave women.

I'd like to help fix the problem. We're missing potential contributions from some of our best and brightest. Ours is a brain-powered industry, and I think we will thrive by nurturing as many brains as we can.

What can I do?

1. First, **wake up**. I'm working to increase my awareness of the challenges faced by women in simulation careers, especially those interested in leadership positions.
2. Second, I can take advantages to **serve as a mentor** and provide guidance whenever there's an opportunity.
3. Third, I'll **talk about this with other men**, especially my fellow middle-aged white guys. Perhaps we can help each other to increase our "wokeness".

One strong image I took home from the conference was a technical committee meeting I attended along with several dozen participants. Here are a few highlights:

- no females among a dozen voting members
- a big room where loud, deep voices prevail
- participants assertively challenging statements made by others

I can't say for sure, but my guess is that list includes some participation barriers for many women. I saw a few women on the sidelines and imagined we were missing out on some valuable contributions. This experience opened my eyes a bit, and I've talked with committee leaders about it. Hopefully our next meeting will be more inclusive.

To help IBPSA-USA become more inclusive, the Equalities Committee (see **https://sites.google.com/site/ibpsaequalitiescommittee/**) is working to set diversity goals for committees (thanks, Annie Marston), and the Board of Directors is committed to tracking committee diversity. Hopefully this is just a first step in achieving better balance within the organization.

I hope to learn about other steps we can take. As I start paying attention, I'm learning I've been ignorant of many barriers faced by women. For example, I didn't know about this one…

IBPSA-USA presents an Achievement Award every two years (which, by the way, has never been awarded to a woman), and the criteria include a long list of potential achievements in research, teaching, model development and software development. None of the past winners has excelled in all these areas; the expectation is that they provide outstanding contributions in just one or two. However, one member of the Awards Committee (thanks again, Annie) pointed out that a woman is not likely to pursue an award or similar opportunity if she feels she doesn't meet all the listed criteria. So, we added the sentence, "Nominees are not required to have made contributions in all areas". Just a little thing. I got a strong affirmation on this issue from two female engineers when I shared this story the next day. I have so much to learn!

I'm encouraged by these small steps, and I hope IBPSA members around the world will share their ideas on more steps we can take to make ours an inclusive society. ■

Apparent Optima: Building performance simulation in early-stage architectural design

Max C Doelling, Senior Building Performance & Interdisciplinary Design Consultant BuroHappold Engineering, Berlin Area, Germany

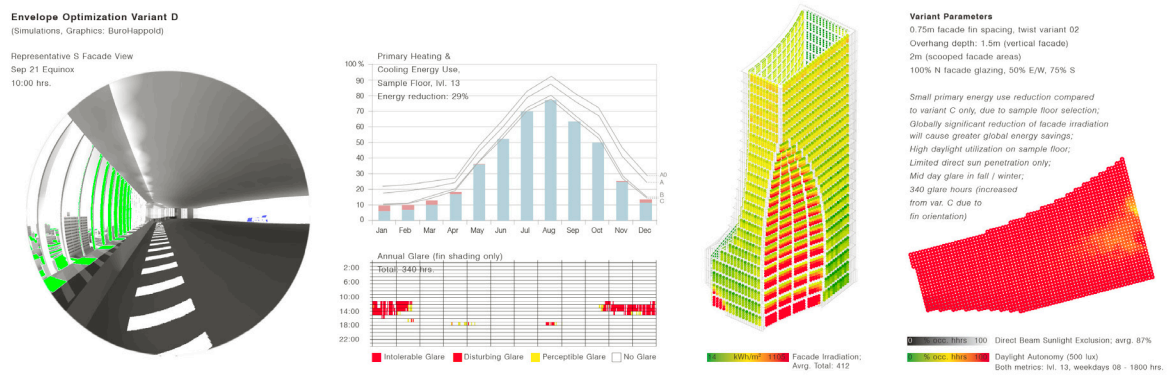


Figure 1: Building performance optimization dashboard – Banque Libano-Francaise HQ *(image and simulations: BuroHappold; architecture: Kengo Kuma & Associates)*

In today's fast-moving market, a significant percentage of high-end architectural projects is still awarded through competitions, which are run at a very fast clip and are often followed by concept design stages that are highly accelerated. Clients thus increasingly expect performance statements made during the competition to remain valid during later stages, instead of facing surprises such as "But the fully glazed tower is so nice, now you're telling me it needs too much energy?".

The discussion about the need for early-stage building performance optimization therefore gains another sharp edge. With key concepts defined in a few precious weeks and from then on firmly lodged in the design DNA, how can we make sure that indeed the right design genes are present to meet energy, comfort and sustainability goals?

This question becomes even more complicated when one considers how, in many (but not all) cases, international architectural competitions are run - which I (provocatively) posit is often "design first, ask hard questions later". While to include engineering for building and environmental performance is by now ever more expected as a deliverable, it is often less clear what influence good environmental design contributions actually have on competition outcomes.

Setting aside structural, fire and MEP engineering, whose fundamental contributions are usually well understood, how do we prove a given design will be thermally and acoustically comfortable, daylit, (naturally) ventilated, indeed healthy - and how do we thus ensure that we do make a difference?

Engineers find truth in calculations, simulations, heuristics, but also propose creative concepts whose engineering will have to happen in reality once a project is won. Excellent architects ideate a space with all its sensory articulations, not just the visual, but multi-sensorial.

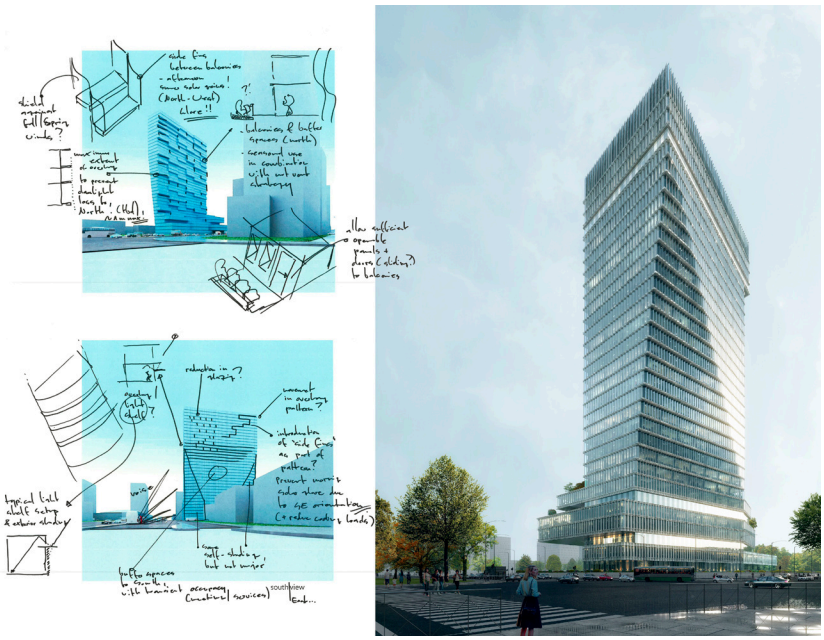


Figure 2: Design performance sketch heuristics – new development bank project *(sketches: BuroHappold; architecture: Mecanoo)*

During the competition process, however, a certain degree of extrapolation of architectural features not yet fully vetted, and claims of qualities that are still subject to design and engineering development, often have to be made to ensure a team's voice is heard, which may make it hard for the engineering team to define what is investigated, and in what fashion. The engineering truth may also become linked to the master narrative, which is charged with strategic impetuses. Care must therefore be taken not to lose sight of more universal goals, which inevitably become important in a project upon its commission.

Hence, returning to the initial questions ("How do we embed the right sustainability genes in a given project?" and "How do we 'prove' conceptual environmental quality?"), the activity of unriddling these has to tread very carefully in order to arrive at legitimate answers, and to remain truthful to principal project goals - also dispelling sometimes justified criticism of e.g. "greenwashing". It is within this charged context that very early-stage design ideation finds itself.

This essay introduces a series of case studies that will be published online over the next few months (and one already being included in this article), in which we show what performance domains were evaluated in designs created during major international architectural competitions, and how the above challenges were tackled in the interdisciplinary narratives.

Domains of interest and investigation scopes naturally vary from project to project; however a few truths have been shown to amalgamate around our set of questions. First again, "How to embed sustainability and building performance DNA?"

- Advocate ceaselessly for key building parameters to respect performance goals (e.g. orientation, functional zoning, facade design, etc.)
- Ensure that concepts retain the ability to change (sometimes "bad" concepts become the de-facto identity of a design. This makes downstream optimization incredibly difficult.)
- Support a holistic temporal understanding of building performance parameters (the way spaces are inhabited over time may shed a different light on designs as opposed to "frozen" concepts)
- Retain an open mind and willingness to innovate; the architecture itself can thus become a catalyst for change
- Respect, and seek synergy with, all other disciplines that influence the design totality

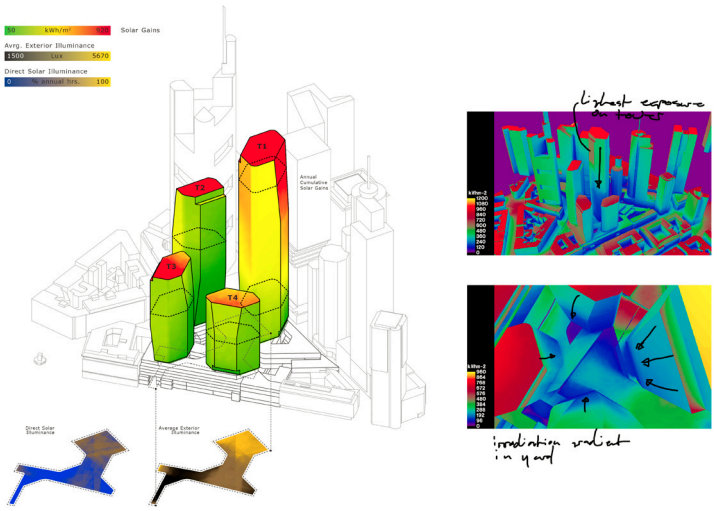


Figure 3: District-scale building simulation – FOUR Frankfurt *(image and simulations: BuroHappold; Architecture: UNStudio)*

Once we have a tentative consensus on the above, how can we calculate, simulate and ideate the ever-changing? To 'prove' it works when not all is yet defined?

- Environmental concepts need to be clearly legible across architecture and engineering deliverables, akin to the way structure enables space
- Simulations may show the "final" design state, but do not necessarily have to, as long as the architecture still has the honest capacity to develop towards optima agreed by the integrated team. This shows a design's performance potential
- Do not shy away from showing tested but not pursued options which did not work
- Focus on spatial performance representations (e.g. daylight, spatial thermal comfort and zonal energy mapping) instead of giving absolute single performance numbers. Spatial effects are prime during the early stages.
- Show relative predicted intensities of savings and improvements only, not absolutes
- Manage and allow interpretational leeway to account for said uncertainties, but make sure you know what scenarios you are accounting for ("Glare? No: these office workers all sit with their backs turned to the windows").

By accepting that during accelerated design processes ongoing change is inevitable, design intent fluctuates, and interpretations are subject to specific (e.g. user behavior) scenarios, we have found in past and in present work that in combination with the above points, we can nonetheless arrive at solutions that have inbuilt

performance robustness. In the following snapshot of early-stage design performance optimization work (and in the articles to be published over the next months), there is always a spark of this interweaving present, however isolated, integrated, tangential or essential the scope of individual assessments has been.

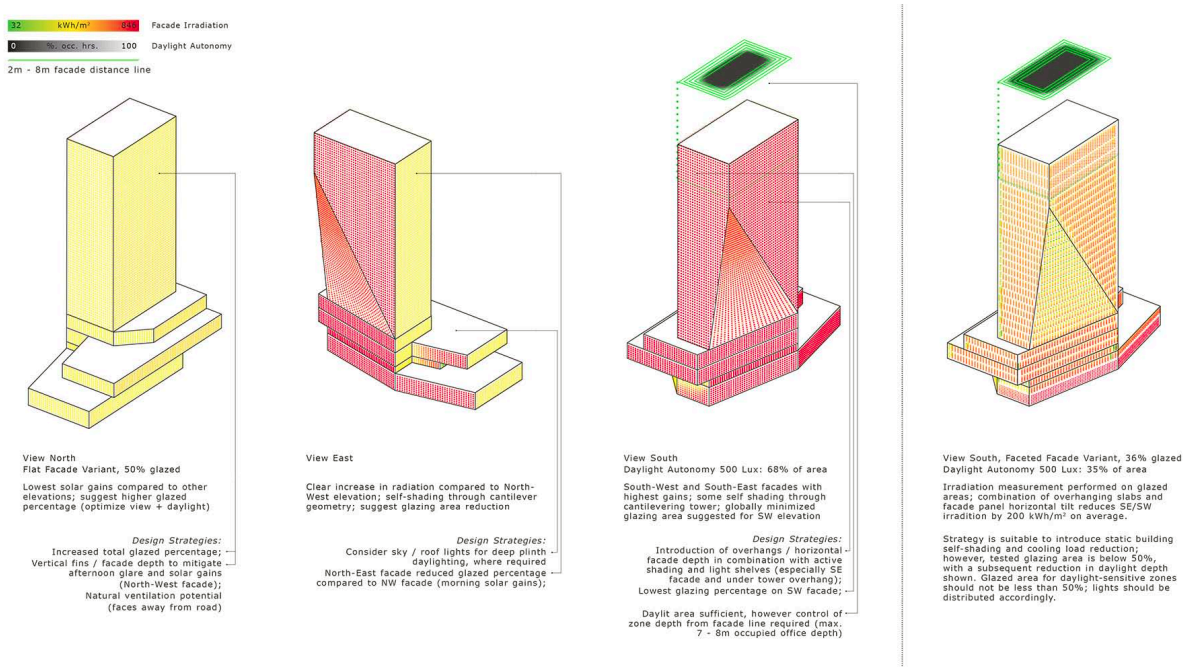


Figure 4: Simple irradiation studies – Shanghai Bank HQ *(image and simulations: BuroHappold; Architecture: Mecanoo)*

The previous section in this article introduced some of the guiding principles interdisciplinary engineering teams can work to in order to deliver integrated building performance from the very first sketches onwards. Openness to innovation, programming sustainability right into the core 'DNA' of a design (while sometimes even influencing building form and massing) and identifying a design's further developable performance potential were identified as key factors that contribute to a project's quality. We also asked the question as to how, in a fast-moving early competition design context, building environmental performance can be demonstrated while a design is still highly flexible and needs to take into account the narrative demands of competition proceedings. The next section thus introduces a first case study – Mecanoo's contribution to a major bank's new HQ competition in Shanghai – intended to shed some light on the interface of high design, environmental performance and interdisciplinary engineering consultancy.

BuroHappold worked with Mecanoo in an interdisciplinary competition team (MEP, Structures, Environmental Design / Building Performance Simulation, Fire Engineering) to support this single-phase invited competition. The Client solicited proposals for its new HQ in Shanghai, China, which is intended to embody the newly founded institution's identity of sustainability, social responsibility and resilient, mindful economic development. Our team did not win the competition, but further reinforced our strong working relationship that has since spawned many successful collaborations.

As Shanghai's climate has both very warm, humid summers and comparatively cold (though typically above freezing) winters (Köppen climate class Cfa – humid subtropical), the design had to work hard to mitigate undesirable solar gains through the facade, create comfortable work place and exterior roof spaces, and still be highly spatially efficient.

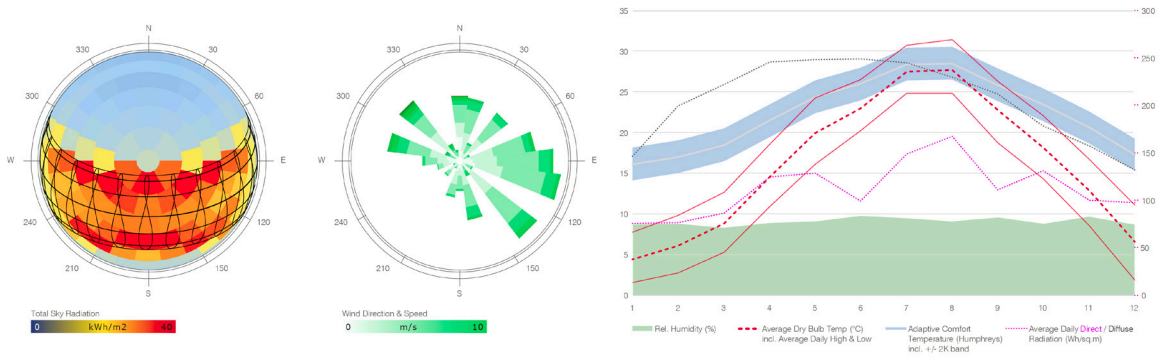


Figure 5: Shanghai climate studies – sky radiation, wind direction/speed, and temperature / comfort ranges *(BuroHappold)*

The Client requested a total glazed ratio of no more than 50% in the brief, which added additional challenges to satisfy daylight utilization – especially in the offices – while allowing a sufficient glazed percentage to visually open up the public areas, e.g. around the street front and roofscape cafes. In general, the Client's aspirations were ambitious, aiming to use the exterior natural environment as much as possible to achieve excellent internal building comfort conditions while relying on passive design principles, and achieving the highest possible GB/T 50378 ("Three Star") and LEED ratings, with according impact regarding the energy use targets.

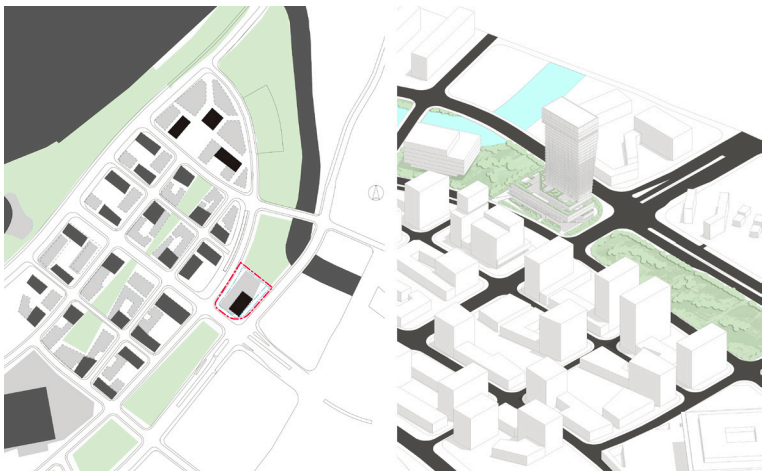


Figure 6: Shanghai HQ site plan and axonometric *(Mecanoo)*

The very early stages of the design process especially considered the urban situation of the former EXPO 2010 site, one of whose plots will be developed for the HQ. Opening views to Shanghai (approximately to the north) and keeping the long office tower façade axis oriented south as much as possible were explored; simple irradiation studies (**Figure 4**) identified the most solar-exposed façades and contributed to avoiding long east or west-facing elevations. Ideally, this very early-stage involvement of specialized engineering disciplines (especially environmental design) has a significantly positive impact.

Another special feature of the design was the introduction of a slanted, diagonal cut to the south-west corner, reducing the floor plate depth towards the lower floors and leading to significant self-shading of the envelope, especially in summer due to high prevalent sun angles. In general, the floor plate depth was kept to within one

8.4m grid in the tower, as deeper floor plates (in combination with reduced façade glazing areas) would lead to suboptimal daylight utilization (and an 8.4m grid is already pushing daylight autonomy utilization to the limit). Similar depth-limiting daylight zoning strategies were pursued across the entire design, with sensitive spaces positioned and shaped for maximum daylight access, and by placing deeper convention and café spaces in the larger plinth (some equipped with skylights for deep plan natural lighting).

Following the massing definition, many façade design typology variants were explored by the integrated team, focusing on means of self-shading through local depth increases (e.g. overhangs), geometric folding and differentiation of the façade layout per orientation (**Figure 2**). The aforementioned limit of the total glazed area posed a significant challenge, necessitating that some areas of the plinth (as seen in **Figure 7**) without overly onerous daylight targets experience a reduction in transparency. To ease the introduction of fine gradients, a main visual façade grid of 1.2m was chosen, though the actual curtain wall panel dimensions were envisioned to be much larger, in order to minimize thermal bridging at the interfaces.

Mecanoo and BuroHappold finally adopted a strategy of using adaptive, non-equilateral triangular façade folds sitting under horizontal static shading bands to structure the façade environmental response. In the final

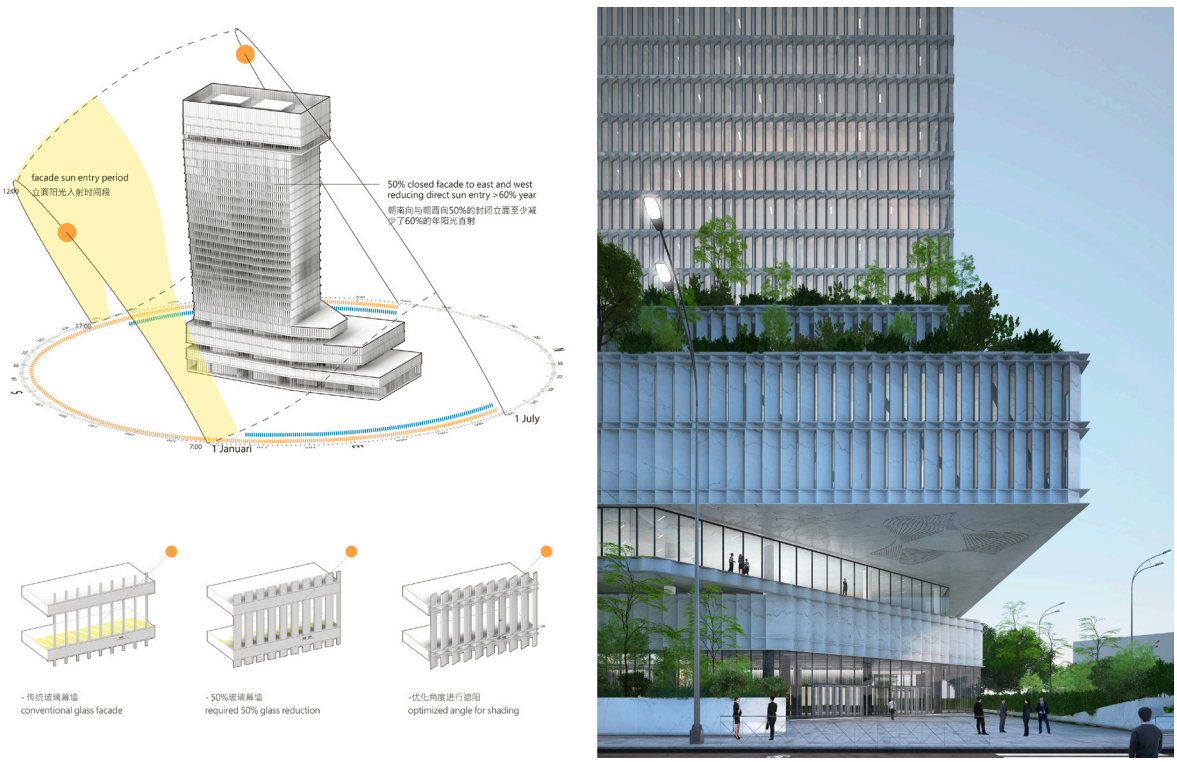


Figure 7: Façade folding strategy & perspective view of Shanghai HQ plinth *(Mecanoo)*

design, the glass gradient gradually opens up from the more enclosed plinth towards the office zones, with subtle shifts in glazing orientation. The shifts are made possible by either flipping the triangle orientation in plan or assigning glass to either the longer or shorter triangle side.

Once the building was locked in plan and the façade principles set, which shift or flip is appropriate for each elevation subsequently became the main question to be answered through building simulation. Both aesthetic

and multi-domain performance considerations (daylight utilization and visual comfort, primary energy use reduction) thus met at the façade interface.

In order to guide Mecanoo's design intent, BuroHappold built a simplified parametric model of a representative office floor plate (**Figure 8**) and tested out a range of different glazing ratio and façade fold setups. The façade was parametricized in Grasshopper and via Honeybee linked to an auto-zoned (core and perimeter) EnergyPlus / Daysim model. Additional glare studies were performed with EvalGlare via DIVA4Rhino, and daylight utilization outputs visualized with the Mr.Comfy analysis plugin.

It is important to note that the façade test variants were not driven by a genetic algorithm or other automated design space explorations, but manually pre-defined through conversation and workshop tests with Mecanoo, as it was clear from the beginning that as long as targets can be met, certain design variants – from an urban and architectural design point of view – are very much preferred. Visual openness and thus underlining the lightness of the vertical massing took centre stage and had to be achieved as part of the competition design narrative.

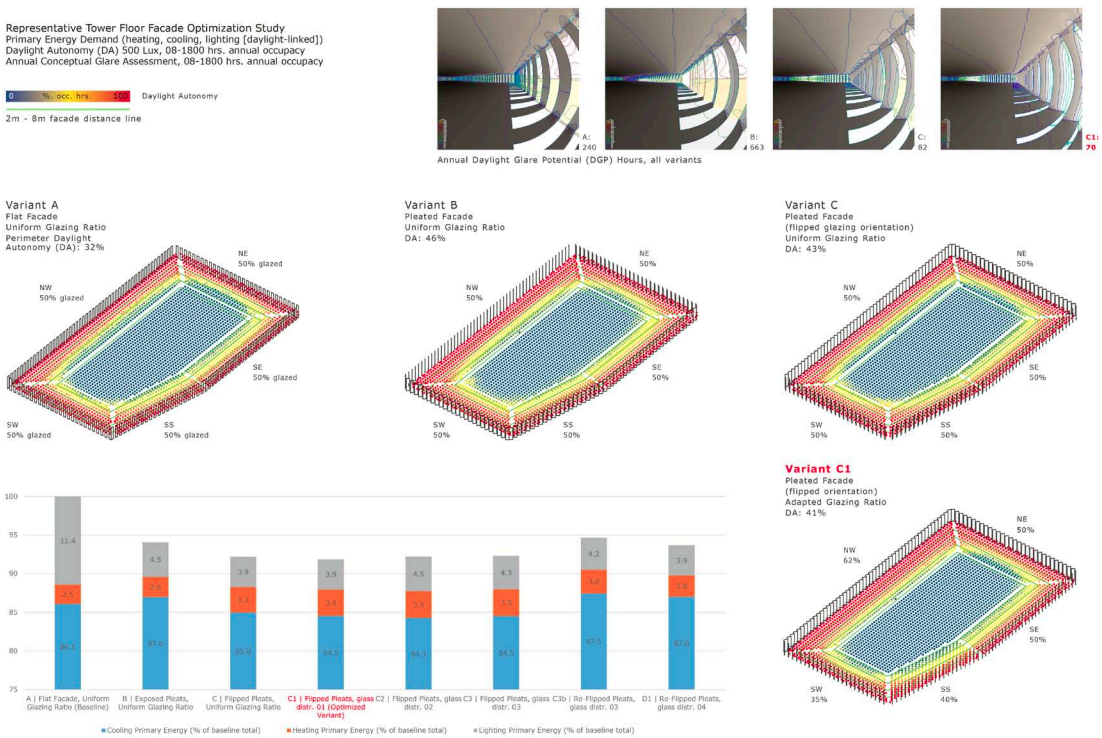


Figure 8: Iterative multi-domain building performance simulation outputs *(BuroHappold)*

Eight design variants were tested with the parametric model, starting with a 50% uniformly glazed, non-folded façade baseline variant (A), via 50% (and folded) designs, and finally up to flipped glazing orientation designs with customized glazed ratios along different orientations (Cx series). Both the relative primary energy demand as compared to the baseline (A), annual glare and daylight utilization (at 500 lux) were used as benchmarks.

Metrics revealed that folding the façade and customizing glazing orientations per elevation has tangible benefits, both in primary energy use and in glare reduction for occupants close to the windows. The best

performing variant (C1) featured a reduced glazed ratio of 35% on the south-west façade (where the glare readings were also taken); discomfort glare hours (without external or internal shading) were reduced to approximately 70 (down from 240 for the uniform variant A) and primary energy use reduced by approximately 8% (compared to baseline).

As the energy simulations were fully daylight-linked (occupancy schedule-driven and light level sensing), the increase in building energy performance was heavily related to variant C1's increase in north-east facing glazing and flipping the glazed façade pleats to the north, limiting direct solar gains while allowing more diffuse light to enter and deepening the daylit extent. Interestingly, the overall daylight autonomy result (41% daylit area) was slightly less than in related iterations, reaffirming that strategically shaping daylight penetration along key orientations is just as important as ensuring generally optimized levels across a floor plate.

Finally, cooling energy use was also reduced by the optimized orientation and limited area of the south-west glass, though high performance low-e glazing (g-value of 0.27) already limited cooling use and internal loads stayed invariant across the comparison matrix. To consider additional external, adaptive shading would have reduced cooling further, but was not explored during these first optimization steps and was intended to be investigated in the next design stages. As described in the following, pursuing these strategies would have been even more important later on, as for architectural reasons, not the best-performing variant (from an energy point of view), but a compromise design was chosen.

Figure 9: Detail view of south-east facade *(Mecanoo)*

The simulations revealed that the features of Mecanoo's design positively impact on overall building environmental performance, with further optimization potential embedded in the system design principles.

Returning to the first part of the article's question of 'how do we "prove" a design's performance while (almost) everything is still in flux?', we see in that in this instance, environmental concepts are indeed clearly legible in the architecture, and we have developed a first understanding of the interplay of design-engineering sensitivities for this specific spatial challenge. It is also the features of the architecture itself that initially define performance variables, retaining an ability and robustness to adapt during the following stages (if they had happened!).

However, despite the design's performance potential, in architectural competitions it is atypical for the 'best-performing' variant (as resultant from the somewhat monocentric point of view of building performance simulation) to be implemented at face value, as only the interplay of urban and architectural quality - of course in their synergy with engineering – makes for a truly exciting project.

No less was true in this instance; observing carefully, one notices that e.g. in the final renderings, the south-west glazing orientation is not flipped to the north - but faces roughly south instead - and the overall glazed fraction is higher than anticipated in the 'ideal' simulation iteration; this was an architectural decision finally made by the team, as to demonstrate openness to the city from this urban vantage point (and opening views into this direction from within the building) was deemed more important than merely claiming performance benefits in isolation.

It thus would have been the plan to solve the resultant visual comfort and energy drawbacks through alternative means during the next stage, e.g. by offsetting some of the increased cooling demand through improved external shading and by harnessing renewable building energy sources, which were already proposed in the concept (especially geothermal cooling). While otherwise outside of the scope of this article, outline MEP concepts and an energy stream map are shown in figure 10; the morphological features of the design were intended to work in unison with the renewables strategy, while minimizing demand sufficiently to allow for low-energy systems to be used throughout.

Figure 10: Energy stream and outline HVAC schematic *(simulations BuroHappold; north-west and atrium views Mecanoo)*

In summary, the design worked across domains to build adaptable performance robustness into the key early-stage design features. The integrated team especially considered façade, massing and underlying MEP concepts to give Mecanoo architectural flexibility while guiding design intent with heuristic advice as well as cross-domain simulations that would have paved the way for future optimizations. Apart from the main decision on glazing orientation, many more granular micro-decisions were taken that throughout the project life cycle would have demanded similar compromises to be made; however, the most important thing regarding early-stage building performance decisions is to keep the holistic picture with all of its interfaces in mind, which is one of the great strengths of working in a multi-disciplinary environment.

Finally, many of the principles we worked with in this competition later made their way into other projects, which is another positive side-effect of 'testing it out': finding genuinely adaptable systems is no small task, and performance intent is often refined across multiple submissions by the same integrated team. One of the next articles in this series will also explore related strategies envisioned by a completely different team of architects. ■

Modelling and indemnity

On 14 July 2017 Peter Simmonds posted a question on the Bldg-sim message board:

> *"Just a simple question: how many simulation experts and modelers provide an indemnity clause to their clients? Are we all guaranteeing the results are true and can be obtained? What happens if predicted results don't materialize? Who's to blame/responsible? Comments and suggestions please."*

This is a very important question, since some jurisdictions have started to look at the regulation of actual, rather than calculated, energy use. What if the simulation results promise compliance but the operating energy use does not comply?

Some modelers include disclaimers to make clients aware of the potential limitations. In the next couple of newsletters Jim Dirkes, Paul Riemer, Nicholas Caton, Dan Nall and others will look at this issue in more detail. Jim Dirkes started the ball rolling with an introduction to the topic in the previous *ibpsa*NEWS (October 2017). Paul Riemer and Pieter de Wilde continue the debate in this edition with an article discussing what and how were we trying to predict and why there is a gap.

If you have any comments and suggestions, please send them to **C.J.Hopfe@lboro.ac.uk** .

Why is there a performance gap?

Pieter de Wilde, Professor of Building Performance Analysis, Associate Head of School and Research Lead for the Built Environment, University of Plymouth, UK

So what is causing the discrepancy between predicted building performance and the measured performance once a building is operational?

It is important to realize that a prediction is just that: a prediction. By nature, this is based on assumptions and estimates; a full match between predicted and measured performance would be a stroke of luck. Some of the factors that need to align to make that happen is that assumed weather conditions, occupant behaviour and control settings will be exactly spot-on. But even then one would expect natural variation in the system to create some variations between prediction and measurement.

However, there are deeper causes that make the situation more complex and cause a much wider gap. First of all, there may be issues with the building design itself, such as misinterpretation of performance targets or straight design errors such as allowing for cold bridges. The use of energy saving technology, while well-intended, may introduce some risk due to teething problems of novel systems. Secondly, we should not assume that our tools and models are perfect. Most of them have a certain application range, and extrapolating beyond this range may cause issues. There also is a question about the training of the analyst who carries out the simulation; as the saying goes, one may want to validate the user, not the software. Thirdly, the

construction stage may result in significant deviation. Typically predictions are based on a design, but how that design translates to an actual building is dependent on a complex process that includes activities like value engineering and introducing change orders. Often there may be a need for on-the-job solutions for unspecified details. The construction environment, taking place in the open air and with limited control over conditions, also is problematic. Once a building is completed, there are various degrees of testing whether the final building matches the design; this can range from a simple visual inspection to see if systems are actually there and to note defects, all the way to long-term commissioning efforts that observe building behaviour over time. Once a building is in use, occupant behaviour (presence and activity) may be significantly different from what was assumed. A typical example is buildings that are being used out of standard hours, such as schools opening in the evening or offices being used at the weekend. Actual control settings are hard to map to assumptions. Plug loads from devices such as computers and printers change over time, and ICT developments are hard to predict. However, meter readings should not be taken as gospel, either – these also have inaccuracies and understanding how various readings are aggregated over a building may require significant efforts.

The final situation thus is one where we need to compare a prediction, which includes some uncertainty, with a measurement that has an error margin. This implies the comparison of two distributions rather than single values. But we also need to become much more explicit with respect to the point in time where a predication or measurement is done. For instance, predictions in early design stages will be different from those at final stages, whereas measurements done in the first year may be dramatically different from others done after three years. This leads to a situation where there is not one single performance gap, but an endless number of performance gaps.

Modelling with purpose: What and how were we trying to predict?

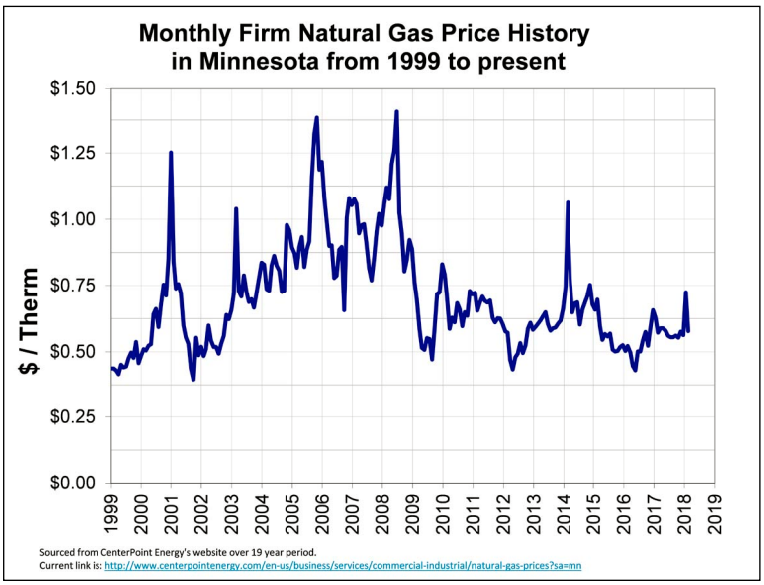
Paul Riemer, Dunham Associates, Minneapolis, Minnesota, USA

As part of a series of articles on indemnity and liability of modeling, let's consider the value of knowing the purpose, metrics, and protocol of a modeling effort. Starting with energy modeling examples will provide a basis for suggestions about how to practice simulation. There are numerous reasons to simulate energy in buildings. The key ones in my career have been to inform the design of a specific building or prototype and to demonstrate compliance or certify a specific building design. For a given purpose, there is typically a primary metric such as:

- Heating and cooling loads – BREEAM
- Peak electrical demand – Minnesota utility incentive programs
- Summer afternoon peak window consumption – Colorado utility incentive programs
- Site energy use at the building meter– Washington State Total code compliance
- Source energy use including generation and transmission losses – Energy Star, BREEAM
- Fuel stream annual consumption – various utility incentive programs
- Regulated energy costs – early versions of LEED, EPAct 179D
- Total energy costs – later versions of LEED, Estidama/Pearl Rating System
- Time Dependent Valuation – California Title 24
- Carbon emissions – BREEAM, 2030 Challenge

The number of metrics listed shows the varied objectives and that one metric does not fit all purposes, so let's examine a few. Peak electrical demand has been an interesting metric The Minnesota rationale is that lowering each building's peak demand results in reduced grid peak demand and thus diminishes the need to build power plants. It is a principally sound rationale that hit snags when building models did not peak during the expected grid peak times. Some examples included K-12 schools that were closed for the summer and heat pump buildings that peaked during morning cool down or during winter heating. In contrast, the time window of a Colorado summer afternoon is much better defined for analysis but doesn't achieve the same purpose.

The metric of annual energy costs appeals to many but has its own complications, particularly the complexities of utility rates. Commercial electric rates often have demand and consumption aspects and sometimes even more complex ratchets and consumption to demand ratios. Many campus and district energy systems are essentially a co-op model where they add up what the central plant spent and proportion it amongst the users by consumption or assigned capacity. Energy costs usually have some unpredictability, either directly for commodities like natural gas or as monthly fuel cost adjustments on electric and district energy bills. The following chart shows the volatility of natural gas prices in Minnesota over the last 18 years. (For an exercise, look at the first half of the chart and consult on whether a client should maintain their steam absorption chiller that runs on steam from the natural gas boilers. Then look at the second half of the chart.)



The 2030 Challenge provides an interesting case study on metrics. The stated ultimate goal is zero fossil fuel energy consumption in 2030. The direction was to use Energy Star Portfolio Manager/Target Finder for the analysis. Energy Star scores based on source energy use intensity but only for some building types. For other building types, the 2030 Challenge recommended comparing against national average site energy use intensity values. The state of Minnesota has adopted the 2030 challenge for state bond funded projects as an effort called Sustainable Buildings 2030 (SB2030). SB2030 and AIA have settled on reporting site energy use intensity. I understand the need to accommodate all building types and to standardize but I have misgivings about using that metric where district/campus heating and cooling systems are in play. Of course, carbon footprint has its own complexities with the variations and lack of documentation in generation, mix of electric utilities and campus/district system, further compounded by ongoing efforts to change their carbon intensity, in some cases rapidly.

While some output metrics have standalone values they are more typically evaluated by comparison, either modeled value vs data set/target or as between modeled values. The specific nature of the comparison is important too. It could be a simple threshold comparison (A>B), differential (A is X less than B) or percent savings (A is Y% of B).

Most projects don't have the need or budget for simulations that are perfect in every aspect, as if that's possible. So, think for a moment of the implications of various combinations of purpose, metric and comparison. On a comparison of mechanical systems, I can probably omit snowmelt and exterior lighting inputs. When modeling for threshold code compliance, maybe only a subset of the planned energy conservation measures need to be modeled and the complex measures can be tabled as 'additional unquantified savings'. If a thermal storage plant will be operated on a complex electrical tariff, then analyzing it using a simplified blend rate would be ridiculous.

So how, then, should our industry practice?

Before modeling, identify your primary purposes and metrics and state those in your proposal and contract. Anticipate secondary purposes with your client as well as your team. Then determine your protocol and plan your modeling. As an example, consider a retail client with stores throughout the US. An energy code change in one state may necessitate modeling of a measure for one store but perhaps it should really be a prototype study of both compliance options and financial value of the measure throughout the planned lists of projects, considering climate and utility rate variations.

As you model, follow your modeling plan and remember to debug your primary metrics as well as your secondary metrics and all of the contributors to them. When presenting your modeling results, plan the charts and tables in your deliverable carefully. Keep the purpose and metric focused in documentation and presentation. Be wary of others repurposing the model or reporting additional metrics. When performing 3rd party modeling of a high rise hotel for annual energy performance, I used simple annual diversity profiles. Regrettably, I put the modeled peak loads in the appendix and they became ammunition in an argument between the developer and the engineer of record about the needed equipment capacities given anticipated tourist levels during peak weather conditions. I could have modeled for that purpose but I had not at that point.

What you do after you have completed your modeling for a project is also important. Don't bury it so deep you forget you have it, keep it handy to leverage if other needs come up on the project or a similar project. Yet also defend abuse of the model. "File…Save as" and change the weather file is not the solution to every fee constrained project.

In conclusion, clearly identifying your purposes and metrics and keeping them in mind throughout your project will enable successful and satisfying projects for you and your clients.

Paul Riemer, PE, LEED AP BD+C, is a Senior Associate Mechanical Engineer with Dunham Associates in Minneapolis, MN. Dunham is a mechanical and electrical consulting engineering firm providing design and commissioning services on new and existing buildings in a variety of building sectors. Mr. Riemer focuses on energy analysis, sustainability, and commissioning.

Forthcoming events

Date(s)	Event	Web site
2018		
12-13 April 2018	**CIBSE ASHRAE Technical Symposium 2018** London, UK	**www.cibse.org/symposium**
09-10 May 2018	**eSim 2018: 10th IBPSA-Canada Conference on Building Simulation** Montreal, Canada	**http://esim2018.etsmtl.ca**
15-16 May 2018	**IBPSA-France Congress 2018** Bordeaux, France	**http://conference2018.ibpsa.fr**
28-29 May 2018	**Joint ASHRAE / IBPSA Research Symposium on Building Performance Analysis 2018** Dublin, Ireland	
04-07 June 2018	**SimAUD 2018: Symposium on Simulation for Architecture + Urban Design** Delft, The Netherlands	**http://scs.org/simaud/**
10-13 June 2018	**EG-ICE 2018 - 25th International workshop on intelligent computing in engineering** Lausanne, Switzerland	**http://eg-ice2018.epfl.ch**
23-27 June 2018	**ASHRAE Annual conference 2018** Houston Texas, USA	**www.ashrae.org/conferences/annual-conference**
27-29 June 2018	**Sustainable Places 2018** Aix-Les-Bains, France	**www.sustainableplaces.eu**
11-12 September 2018	**Building Simulation and Optimization 2018** Cambridge University, UK	**www.bso2018.event.cam.ac.uk**
26-28 September 2018	**2018 ASHRAE Building Performance Analysis Conference and SimBuild** Chicago, Illinois, USA	**www.ashrae.org/conferences/speciality-conferences/2018-building-performance-analysis-conference-and-simbuild**
26-28 September 2018	**BauSIM 2018** Karlsruhe, Germany	**www.bausim2018.kit.edu**
09-10 October 2018	**American Modelica Conference 2018** MIT, Cambridge, Massachusetts, USA	**www.eventbrite.com/e/the-american-modelica-conference-2018-tickets-39188362447**
29-30 November 2018	**uSIM 2018: Urban Energy Simulation** Glasgow, UK	**www.usim18.org.uk**
03-05 December 2018	**Asim2018: 4th IBPSA Asia conference** Hong Kong, China	**www.bse.polyu.edu.hk/ASIM2018**
10-12 December 2018	**PLEA 2018** Hong Kong, China	**www.plea2018.org**
2019		
02-04 September 2019	**BS19: Building Simulation 2019** Rome, Italy	**www.buildingsimulation2019.org** ***** SEE WARNING ON PAGE 6! *****

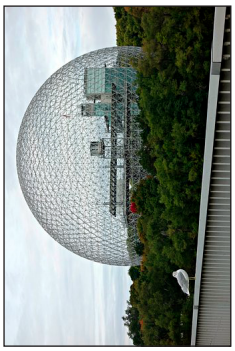
Note that the dates in this calendar may, but do not necessarily, include pre and/or post-conference workshop days

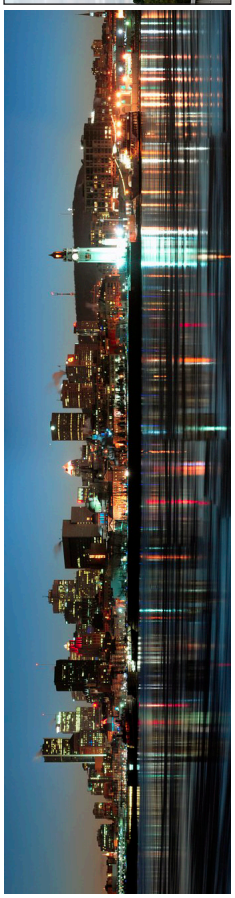
eSim 2018: 10th IBPSA-Canada Conference on Building Simulation

09-10 May 2018
Montreal, Canada
www.ibpsa.ca

ÉTS Montréal and IBPSA-Canada are pleased to invite you to the 10th eSim 2018 conference in Montréal, Quebec on 9-10 May 2018. The conference theme will be 'Building simulation to support building sustainability' and will cover a broad range of topics.

The conference is paired with pre- and post-conference workshops on 8 & 11 May, taught by experts, aimed at enhancing design professionals' simulation knowledge. These are supported by a new feature for eSim 2018, a practitioner's track, on 9 May, co-hosted by the Canada Green Building Council – Quebec.





The reviewing phase is currently coming to an end, and papers will be presented in all the conference topics, with particularly large numbers of papers in the categories in bold:

- **Modelling physical processes**
- Modelling innovative building envelope systems
- **Modelling innovative HVAC systems and components**
- Modelling building-integrated renewable energy systems and components
- Modelling airflow, infiltration, natural and hybrid ventilation
- Modelling interactions between the building and its environment (LCA, GHG emissions, weather impact)
- Modelling and characterizing occupant comfort and well-being
- **Modelling occupant behaviour in buildings**
- Building simulation software development and quality control approaches
- Building simulation for design and optimization
- Building simulation for code compliance and code development, and incentive programs
- **Building simulation for operation (control, continuous commissioning, fault detection, auditing)**
- **Building simulation to assess and optimize energy flexibility**
- **Urban- or community-level modelling and integrated systems, building stock modelling**
- Lighting and daylighting analysis and modelling
- Moving simulation into practice—case studies of innovative simulation approaches
- User interfaces, software interoperability, facilitating the workflow between architects and engineers
- **Model calibration, validation, using and analyzing experimental data**

About 70 papers are expected to be presented, authored by researchers and practitioners from Canada, North America, Europe, the Middle East, and Asia.
In the heart of the St. Lawrence River, Montréal is a dynamic city where modern constructions and historic buildings coexist. The banquet will be held in a historic building that has witnessed the industrial development of the city. Take this opportunity to discover this bilingual metropolis that attracts several high-tech companies and presents an impressive cultural offer. **Registration is now open**; please visit **http://esim.ca** for more details. ■

ASHRAE Ireland Chapter IBPSA - Ireland

American Society of Heating Refrigeration & Air-Conditioning Engineers
International Building Performance Simulation Association

Joint ASHRAE / IBPSA Research Symposium on Building Performance Analysis 2018

Museum Building
Trinity College Dublin
Monday, May 28th & Tuesday, May 29th, 2018

ASHRAE Ireland Chapter & IBPSA-Ireland are delighted to host a Research Symposium on Building Performance Analysis to be held at Trinity College Dublin.

ASHRAE Ireland / IBPSA-Ireland

ASHRAE Ireland was founded to promote and disseminate all aspects of HVAC technologies to professionals and industries in Ireland.

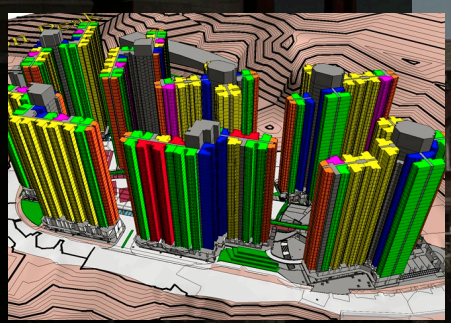
IBPSA-Ireland was founded to advance and promote the science and technology of building performance simulation in Ireland.

Symposium Aim

The overall aim of the symposium is to bring together graduate students and researchers from Irish third-level institutions who are engaged in research related to analysis and simulation of the built environment. Given the diversity of ongoing research, the symposium will act as a unique forum to highlight both the breadth and depth of activity in the building performance analysis arena, as well as providing an opportunity for researchers to share their experiences. Invited keynote speakers at the symposium will be Prof. Vincenzo Bianco, University of Genoa and Prof. Dimitrios Rovas, University College London.

Presentation/Poster Submission

Researchers and graduate students are invited to give a short presentation or submit a poster.



Symposium Dinner

To facilitate networking opportunities amongst participants, a symposium dinner will be take place on the evening of Monday, May 28th at a central Dublin city location.

Registration

To register your interest, please email mattia.derosa@ucd.ie. If you would like to give a talk or present a poster at the symposium, please indicate your preference accordingly and forward a title, keywords and short abstract by email to the above before Monday, April 16th, 2018. There is no registration fee to attend the symposium, but dinner will be at the expense of the individual participants.

Organising Committee: Mattia de Rosa (UCD), Donal Finn (UCD), John Gallagher (TCD), James O'Donnell (UCD), Adam O'Donovan (CIT).
Contact: mattia.derosa@ucd.ie

04-07 June 2018
Delft, The Netherlands
http://scs.org/simaud/

SimAUD 2018: Symposium on Simulation for Architecture + Urban Design

Built environment simulation and design computation have become ubiquitous throughout the design world, from small scale offices to multinational firms. Simulation workflows harness the ever-growing power of personal computers, and the increasing use of cloud computing, to aid design teams in their increasingly complex endeavors throughout the globe. Disciplinary boundaries are blurring, as simulation-based decision support systems bring experts from various fields together to develop low-tech solutions, using high-tech simulation tools. The 9th annual Symposium on Simulation for Architecture and Urban Design (SimAUD) therefore aims to create a trans-disciplinary scholarly platform bringing together the brightest researchers and practitioners in the fields of architecture, urban design, urban planning, building science, visualization and simulation.

This year's event will be held at TU Delft's campus, the largest and oldest Dutch public technological university in the Netherlands.

Past SimAUD symposia have attracted exceptionally high-quality submissions (papers, notes, works in progress, datasets, and videos). We highly encourage you to take advantage of the free downloads of previous years' proceedings.

SimAUD topics include:

- Simulation-based Generative Design
- Simulation-based Design Tools and Methods
- Multidisciplinary and Collaborative Design and Design Optimization
- Simulation Performance and Scalability
- Simulation of Occupant Behavior
- Simulation of Building Controls
- Physics-Based Simulation in Design
- Whole Building Energy Simulation
- Thermal Comfort & Occupant Satisfaction
- Lighting and Daylighting
- Airflow In & Around Buildings
- Acoustics Modeling, Simulation & Design
- Visualization of Simulation Data
- Urban-Scale Modeling
- Uncertainty, Validation and Risk Management
- Augmented and Virtual Reality
- Design Agency & Multi-Agent Systems
- Intelligent Buildings & Building Lifecycle Management
- Sensor Networks & Building Performance Monitoring
- Interactive Environments
- Responsive Facades
- Robotic Fabrication in Design

You can find more information about SimAud 2018 at **http://simaud.com/2018/**, **www.facebook.com/simaud2018/** and via Twitter **@SimAUD2018**.

BSO18

11-12 September 2018
Cambridge University, UK
www.bso2018.event.cam.ac.uk

IBPSA-England

UNIVERSITY OF CAMBRIDGE

BSO18: Building Simulation & Optimization 2018

IBPSA-England's fourth conference, BSO18, will provide a forum for the exchange of knowledge on the development and application of building performance simulation to optimum design and operation of buildings.

The main themes in 2018 will be:

- New building performance simulation methods (e.g., energy, comfort, daylighting, airflow, air quality)
- New approaches for optimizing design and operation
- New decision support methods for real world applications (e.g., design, compliance, commissioning, predictive control, retrofit)
- Advances in model calibration, uncertainty analysis, and validation methods
- Occupant behaviour modelling
- Urban- and district-scale simulation of energy and environment
- Innovative applications of simulation in practice.

BSO18 will be held at Emmanuel College, University of Cambridge. Emmanuel was founded in 1584, on the site of a Dominican priory, by the Chancellor of the Exchequer to Queen Elizabeth I. Parts of the monastic buildings remain today, and the Hall is built on the foundations of the nave of the Dominicans' church.

For delegates who can arrive early, there will be a walking tour of Cambridge on Monday afternoon, 10 September. There will be a conference dinner on Tuesday evening.

Key dates

The dates for submission of abstracts and full papers have passed. Remaining key dates are:

Paper review notification:	27 April 2018
Final paper submission:	01 June 2018
Final decision to authors:	29 June 2018
Registration opens:	01 July 2018.

SimBuild & ASHRAE Building Performance Analysis Conference 2018

26-28 September 2018
Chicago, Illinois, USA
www.ashrae.org/conferences/speciality-conferences/2018-building-performance-analysis-conference-and-simbuild

ASHRAE and IBPSA-USA will hold their third co-organized conference at the Hilton Chicago on 26-28 September 2018.

"Building performance modeling is transforming the industry to meet the net zero and Architecture 2030 design goals, improving operational efficiency and occupant comfort," said Krishnan Gowri, conference chair. "Recent advancements in machine learning, data science and sensor technologies are opening up new avenues to advance the analysis and modeling techniques to meet the challenges faced by designers and modelers. This conference seeks to connect the researchers and industry practitioners to facilitate the adoption of these new techniques and workflows to make better decisions through the application of simulation and modeling over the entire building life cycle."

Modelers, architects, software developers and researchers will address the use of existing simulation tools in building performance analysis, energy modeling and building performance simulation, software development and future research and applications.

The call for papers has now closed, and papers have been accepted on the following topics:

- **Buildings and Information Technology Nexus**
- **Modeling Advances**
- **Early Design**
- **Multiple Systems Modeling**
- **Big Data**
- **Health, Wellness and Comfort**
- **Energy Performance and System Simulation**
- **Codes, Standards and Compliance**

Registration information was not available at the time of going to press.

To learn more about the conference go to **www.ashrae.org/conferences/speciality-conferences/2018-building-performance-analysis-conference-and-simbuild**. ■

BauSIM 2018

26-28 September 2018
Karlsruhe, Germany
www.bausim2018.kit.edu

Solving complex issues of sustainability and energy efficiency - at building as well as urban and regional level - requires a holistic, integrated approach. To address this challenge, BauSIM 2018 will focus on two themes that are of great importance for simulation-based planning tools, in which research and practice are developing fast, and which are also major research focuses of the two conference chairs Petra von Both and Andreas Wagner: **BIM-based Planning Aids and Integration Approaches**, and **Modeling User Behavior in Buildings**. The full range of topics to be addressed includes:

BIM-based planning tools and integration approaches

- Digital and model-based planning methods
- BIM-based simulation and calculation tools
- Data models and standards in the context of simulation
- Multiscale modeling approaches
- Interfaces and interoperability at the level of building and city information models
- Innovative applications of BIM in the simulation context
- Dynamic coupling of simulation methods, co-simulation, model exchange

Modeling user behavior in buildings

- comfort (thermal, visual, auditory, olfactory), physiology
- Room climate, indoor air quality and room air flow
- Interaction users - buildings - technical building equipment
- Function integration of active facades

Modeling and simulation in the life cycle of buildings and urban systems

- Simulation-based planning tools
- Holistic accounting methods
- Algorithms for computer-aided decision and verification procedures
- Model-based control and operation optimization
- Hardware-in-the-loop simulation

Integrated building and energy concepts

- Regenerative, decentralized energy systems
- Communication building services - Energy supply infrastructure

- Regulatory issues (load management, network efficiency)
- Coupling of building and plant simulation
- Tools for building and neighborhood simulation

Numerical solution methods, optimization and implementation

- Mathematical methods for integrators, equation solvers, preconditioners
- Equation reduction and symbolic analysis, compiler development
- Implementations and libraries for optimization and parallelization
- Solution Methods for Differential Algebraic Equation Systems (DAE)
- Computational Fluid Dynamics (CFD) method
- Interdisciplinary optimization approaches in simulation

Product data, databases

- Data structures, formats, standards for databases
- Availability, quality of the data
- Data acquisition, data archiving and processing
- Legal aspects - testability / traceability / reproducibility

Validation scenarios, quality assurance

- Parameterization, calibration and quality control of models
- Development of reference solutions for standards
- Methods of representation and visualization
- Data maintenance, sustainable archiving of solutions

Building monitoring and operation optimization

- Construction and commissioning of monitoring projects
- Data management and analysis in monitoring projects
- Strategies for optimizing the operation of building systems
- Comparisons and evaluation of simulation vs. measurement data

Teaching, training and further education in the field of simulation

Knowledge transfer for simulation practice, with practical examples

120 contributions have been selected by the scientific committee. In addition to full papers, the program will also include keynote speeches and a special session for PhD students. Free workshops directly organized by simulation software suppliers will extend the conference for a further day until 29 September 2018. The proceedings will be published digitally with listing in the Digital Object Identifier System; the best papers will also appear in print in the German BAUPHYSIK journal in December 2018.

The official conference language is German but contributions in English have also been welcomed.

For more information please visit **www.bausim2018.kit.edu** . ■

uSIM 2018 Conference - 2nd call for abstracts

http://www.usim18.org.uk

IBPSA-Scotland are organising a conference on Urban Energy Simulation. This will focus on the evolution of building simulation tools and their application to larger scale energy systems, such as community energy schemes, building stocks, district heating, smart grids and multi-vector energy networks. Applying building simulation to these wider energy systems brings its own unique set of challenges in areas ranging from data acquisition for multiple buildings to software developments to accommodate external energy grids. It is intended that uSIM will bring together experts from academia and industry to explore the key challenges and to progress the state-of-the-art in knowledge and capabilities.

uSIM will be hosted by the University of Strathclyde, Glasgow, 29-30 November 2018 and is supported by IBPSA Scotland, the Energy Technologies Partnership (ETP) and IES Ltd. The conference is being organised by the Energy Systems Research Unit (ESRU).

Original contributions are welcome from researchers and practitioners in these indicative conference themes:

- Modelling and simulation for community energy, smart heat and smart power networks
- Commercial and domestic stock modelling and bottom-up stock modelling approaches
- Modelling and simulation for distributed and centralised storage analysis
- Urban energy resource estimation
- Data acquisition and datasets for multi-building modelling
- Modelling diverse occupant populations and energy behaviours
- Software development and integration
- Data analysis, visualisation and performance metrics
- Calibration and validation
- Modelling urban microclimate
- Case studies in urban modelling and simulation

Abstracts of up to 500 words can be submitted via the uSIM conference website, http://www.usim18.org.uk.

The deadline for Abstracts has been extended to Friday 16 March. All abstracts will be peer-reviewed with full papers for accepted abstracts due Friday 27 April 2018.

We look forward to welcoming you to Glasgow in 2018!

The uSIM Team

Conference Supporters

IBPSA Scotland

energy technology partnership

IES Ltd

Welcome to ASIM Conference 2018

IBPSA Asia Conference
Hong Kong • December 3-5

Welcome!! We sincerely invite you to attend the 4th Asia Conference of International Building Performance Simulation Association - ASim2018, held on 3-5 December, 2018 in Hong Kong. This biennial conference will provide a platform for academics, professionals, consultants, designers, engineers and research students exchanging ideas, knowledge and information about building performance simulation. ASIM 2018 program will include keynote speeches, technical sessions, workshop sessions and poster presentations discussing all aspects of building performance simulation. We are looking forward to seeing you in Hong Kong!

Organized by

IBPSA-China 国际建筑性能模拟学会中国分会

Co-organized by

The Hong Kong Polytechnic University 香港理工大學

Scientific Committee Chair:
Yingxin Zhu (Tsinghua)
Executive Chair:
Da Yan (Tsinghua)

Conference Chair:
Shengwei Wang (HK PolyU)
Co-Chairs:
Hongxing Yang (HK PolyU)
Gongsheng Huang (HK CityU)
Executive Chair:
Fu Xiao (HK PolyU)
Secretary:
Rui Tang (HK PolyU)

Call for Paper

Topics

1. Building physics
2. Simulation and real performance
3. Simulation in design practice
4. Simulation for regulation/code compliance and certification
5. Software/Interface development, test and validation
6. Simulation to support commissioning, controls and monitoring
7. Case studies of building simulation application
8. Community/Urban scale modelling and simulation
9. Occupant behavior in buildings
10. Indoor environment: comfort, air quality, lighting and acoustic
11. Optimization of control and design
12. BIM and BEM
13. Uncertainty and sensitivity analysis
14. Machine learning and data-driven model

Publications

Special issues of selected papers from ASIM 2018 will be published in "Science and Technology for the Built Environment" or "Building Simulation".

Important Dates

Call for paper: February 28, 2018
Abstract submission deadline: April 27, 2018
Abstract acceptance notification: May 25, 2018
Draft paper submission deadline: July 27, 2018
Paper acceptance notification: September 14, 2018
Early registration deadline: November 9, 2018
Online registration deadline: November 23, 2018

Conference website: http://www.bse.polyu.edu.hk/ASIM2018

www.buildingsimulation2019.org

Conference Venue: *Angelicum Congress Center* seat of the Pontifical University "S. Tommaso d'Aquino"

CALL FOR ABSTRACTS WILL START IN APRIL 2018

Program:
- Presentations on research
- Case studies and best practices
- Panel discussions
- Software demos and exhibition
- Simulation competitions
- Technical tours and cultural visits

Topics:

Building acoustics
Building Information Modelling (BIM)
Building physics
CFD and air flow
Commissioning and control
Daylighting and lighting
Developments in simulation
Education
Energy storage
Heating, Ventilation and Air Conditioning (HVAC)
Human behaviour
Indoor Environmental Quality (IEQ)
New software development
Optimization
Simulation at urban scale
Simulation to support regulations
Simulation vs reality
Solar systems
Validation, calibration and uncertainty
Weather
Windows
Zero Energy Buildings (ZEB)

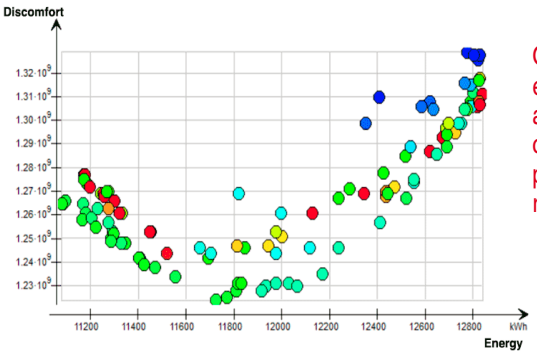
Software news

EQUA releases updated version of IDA ICE

Swedish company EQUA has recently released version 4.8 of its IDA Indoor Climate and Energy (IDA ICE). The new version introduces many new features, as well as several usability and productivity improvements.

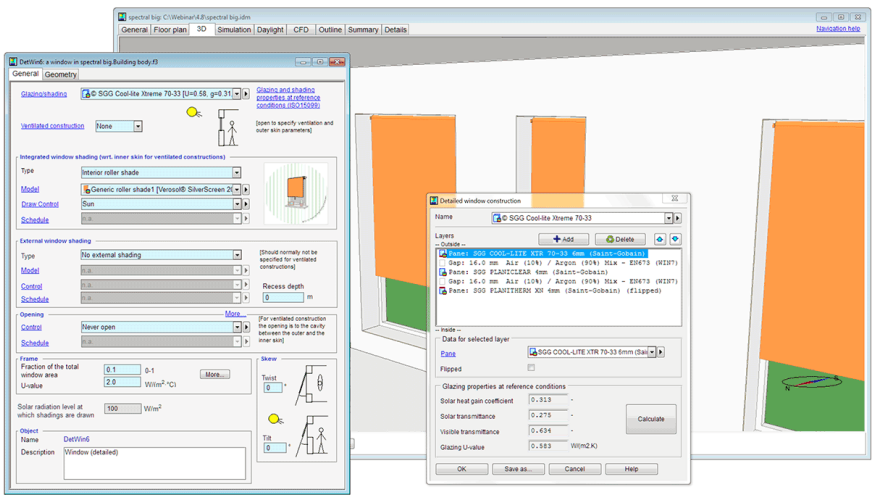
Some of the highlights in IDA ICE 4.8:

- Parametric runs and optimization inside IDA ICE. Using the simulation model to optimize e.g. window properties, supply air temperature or the size and slope of solar collectors is an obvious application. With IDA ICE 4.8 this is as easy as it sounds. The user can easily drag and drop input parameters and target output (cost function) from the model into the interface. In addition to optimization, Monte-Carlo and sensitivity analysis (Morris method) are supported.



Optimization of energy usage and thermal comfort, using parametric runs

- Spectral calculation is introduced for glazing and integrated sunshades. This means that the properties of the whole glazing/sunshade system are calculated for each wavelength interval. Spectral data can be uploaded by manufacturers at any time and is automatically synchronized with user databases.



Spectral calculation for glazing and integrated sunshades

- Overheating calculation is a new simulation type to automatically find the worst day for rooms that have no or limited mechanical cooling. The result is presented at the time of either maximal air temperature, operative temperature or PPD.
- The IFC import has been improved in several ways. Now also exporting key results via IFC has been implemented.
- Zones can now easily be split into smaller zones, or merged together into larger zones. With these new features, complicated building can be divided into floors and zones, and it makes it easier to create complicated zone geometries.
- An air handling unit with a new rotary heat exchanger model, based on prEN 16798-5-1, is introduced.
- New thermal bridge definitions. National standards are based on different conventions for defining thermal bridges and envelope area. IDA ICE 4.8 supports five different definitions of thermal bridges and envelope area, as defined in ISO 10211.
- Three new types of typical shading devices can now easily be selected for the detailed window model; Micro lamellas (shading dependent on two angles), Venetian blinds between panes, and Screens between panes. Access to manufacturer data for shading materials has been enabled. The shading devices are visualized in the 3D view and their movement can be animated.
- Application Programming Interface. IDA ICE can now be controlled by an external program by direct calls from, e.g. Python, Matlab, Excel, C++, Java or similar.

To learn more about the new features, visit **www.equa.se/en/ida-ice/what-is-new/highlights-in-4-8**.

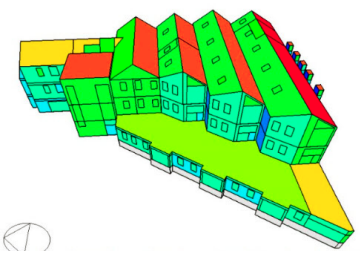
For inquiries, please contact EQUA at **info@equa.se**. ■

DesignBuilder announce biggest ever incremental release

DesignBuilder v5.3 has been released, adding important new visualisation, daylighting, LEED, façade modelling and LCA features (plus many more!) Highlights include:

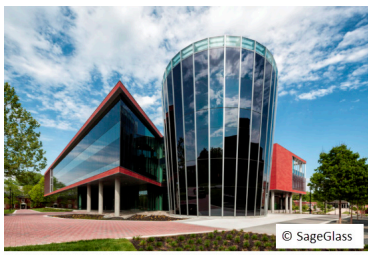
Data visualisation tools

Designed for checking and communicating building surface and zone data, the new data visualisation tools allow simulation results to be rendered onto the 3-D model, helping users to quickly identify any "hotspots" and gain an overall feel for building environmental performance.



Applications include checking for optimal location for solar collector panels, identifying areas of the building that are liable to overheating, and assessing window solar gains across the building.

Dynamic facade systems

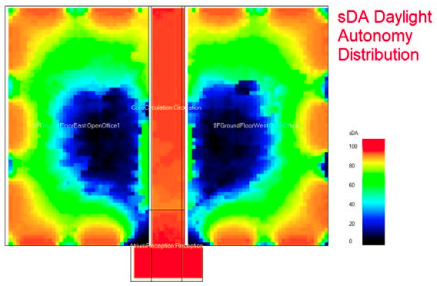


DesignBuilder allows a wide range of traditional and advanced façade types to be modelled. The latest version adds a new way to model SageGlass dynamic glass, and to assess and visualise its impact on key building performance indicators. This collaboration with Saint Gobain makes a wide range of control strategies available to adapt to individual project and client requirements, and to perform optimisation calculations and analyses. Comparison with other dynamic façade technologies such as conventional glazing with automated blinds, and thermochromic glazing, is also now possible.

New façade modelling productivity tools have been added to allow façade types to be quickly assigned to various parts of the building based on surface orientation, slope etc.

DesignBuilder expect this to open new possibilities and insights to professionals into how to use dynamic facades in their design strategies to optimize their sustainability and comfort targets.

New daylighting metrics



The latest climate-based daylight performance metrics consider the impact of design decisions over the whole year using real recorded climate data. DesignBuilder v5.2 uses the Daysim engine to provide a range of annual daylighting metrics including Spatial Daylight Autonomy (sDA), Annual Sun Exposure (ASE) and UDI. These can be used for assessing qualification for certification credits for a range of international schemes.

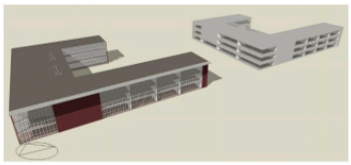
sDA, ASE and UDI distribution maps, summary outputs and LEED v4 BC+D daylight reports can all be generated.

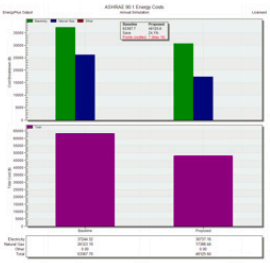
Construction cost modelling

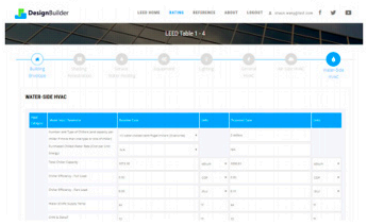
DesignBuilder offers a way to assess the economic impact of early-stage building designs, including construction cost, utility tariffs and life-cycle cost analysis. With v5.2, construction cost reports now support industry standard reporting formats, with options for levels 1 and 2 NRM1 (RICS, UK) and UNIFORMAT II (ASTM, US and Canada).

DesignBuilder claims to be the only tool to provide advanced cost-benefit design optimisation in an easy to use package.

ASHRAE 90.1 Appendix G automation







The LEED and ASHRAE 90.1 automation tools built into the latest DesignBuilder provide a fast way to complete an ASHRAE 90.1 Appendix G PRM analysis. The latest version includes:

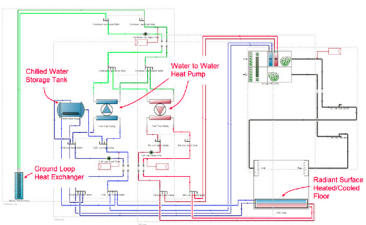
- Fully automatic baseline building generation with proposed and baseline buildings both included in the same model.
- Guided semi-automatic baseline HVAC system generation wizard including auto-assignment of AHUs and single-zone systems.
- Automatic parallel simulation of the 4 rotated baseline buildings and averaging of the results.
- On screen comparison of proposed and baseline building cost and energy simulation results.
- All constructions, materials, glazing systems, activities, lighting and HVAC systems required for ASHRAE 90.1 2007 and 2010 are included and automatically set as required within the DesignBuilder modeller.
- Linked online LEED documentation preparation system for EAc1, EAp2, Table 1.4 reports.

Building Life Cycle assessment, One Click Away

DesignBuilder have partnered with One Click LCA, a leading Building Life Cycle Assessment and Life Cycle Costing tool, to provide native integration for Ecodesign, Green Building credits, and informed sustainable decisions. This new integration allows DesignBuilder users to:

- Transfer energy models seamlessly to One Click LCA for additional materials analyses.
- Achieve BREEAM Mat 01 LCA and LCC credits and LEED v4 LCA and materials credits.
- Use One Click LCA's material database to get a true picture of the carbon & LCA performance.

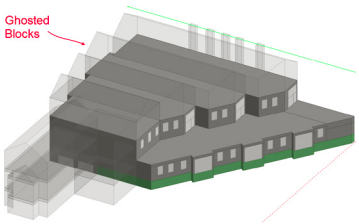
New HVAC systems



The detailed HVAC modelling toolset has been upgraded to include radiant surfaces with reversible heating/cooling, chilled water storage tanks and 3 new chiller types.
The screenshot on the right shows an example high-efficiency water to water heat pump system with cold water storage and switchable heated/chilled floor zone component.

Improvements to the modeller

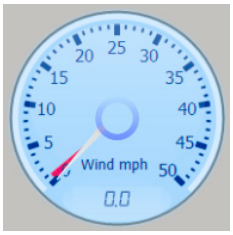
Further extensions in the DesignBuilder v5.3 modeler include gbXML export, import 2-D elevation drawings for drawing facades etc, selective ghosting of blocks to provide access to blocks behind (see right) and a new way to show building surfaces, zones and blocks in the context of the rest of the building.



These improvements have been requested by popular vote in recent customer surveys.

More details…

A more detailed list of new v5.3 features is available at **www.designbuilder.co.uk/whats-new-in-v5**. For more information, DesignBuilder can be contacted through **www.designbuilder.co.uk/about-us/contact-us**. ■



New weather data set for Mexico, Caribbean, Central and South America and Antarctica now available from Climate.OneBuilding.Org

Climate.OneBuilding.org is pleased to announce the availability of a new simulation weather data set (TMYx) which will be available in April 2018 for locations in Mexico, Caribbean, Central and South America and Antarctica, derived from the ISD (US NOAA's Integrated Surface Database) with hourly data through 2017. TMYxs for more than 1100 locations in the Americas are available. There may be two TMYxs for a location, e.g., MEX_MEX_Cuidad.Mexico-Juarez.Intl.AP.766793_TMYx, and MEX_MEX_Cuidad.Mexico-Juarez.Intl.AP.766793_TMYx.2003-2017. In these cases, there's a TMY for the entire period of record and a second TMY for the most recent 15 years (2003-2017). Not all locations have recent data.

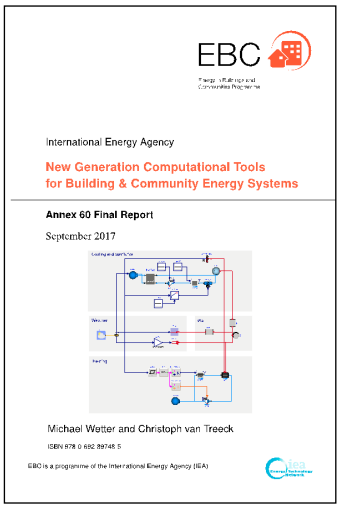
With the addition of these data for the Americas, Climate.OneBuilding.org now provides free data for more than 4,000 locations worldwide. All data have been through extensive quality checking to identify and correct data errors and out of normal range values where appropriate.

Each weather location .zip contains: EPW (EnergyPlus weather format), CLM (ESP-r weather format), and WEA (Daysim weather format) along with DDY (ASHRAE design conditions in EnergyPlus format), RAIN (hourly precipitation in mm, where available), and STAT (expanded EnergyPlus weather statistics).

For more information or to download any of the weather data (at no cost) go to **http://Climate.OneBuilding.org**. ■

IEA EBC Annex 60 has been finished

Michael Wetter (LBNL, USA) and Christoph van Treeck (RWTH Aachen, Germany).



The 5-year collaboration among 42 institutes from 16 countries, organized within IEA EBC Annex 60 has been closed. The final report — together with several research papers that resulted from the collaboration — is available at **www.iea-annex60.org/pubs.html** as a book, as a free PDF file and as html pages.

The Final Report consists of 500 pages that describe new generation computational tools for the design and operation of building and community energy systems. The report summarizes the development of Modelica models, approaches and tools for co-simulation based on the Functional Mockup Interface standard, Building Information Modeling technologies based on the Industry Foundation Classes, as well as tools for workflow automation that have been developed in Annex 60. The report also demonstrates how these technologies have been used in applications such as rapid virtual prototyping, design of local and supervisory control algorithms, and deployment of models in support of commissioning and operation.

The target audience of the final report is the building energy research community, design firms and energy service companies, equipment and tool manufacturers, as well as students in building energy.

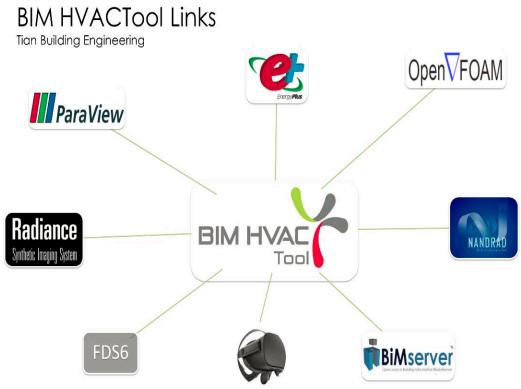
Some of the R&D conducted in Annex 60 will continue within the IBPSA Project 1. See **https://ibpsa.github.io/project1/** for more information and how to join. ■

BIM HVACTool has released version 2.0.0

Thomas Tian, TIAN Building Engineering

The BIM HVACTool, developed by Thomas Tian in Berlin, Germany, allows expert users to couple several simulation programs for Energy, CFD, Daylighting and more for co-simulation, and to share results interactively. For example, the BIM HVACTool supports simulating a building in EnergyPlus and Computational fluid dynamics in OpenFOAM, taking temperature from the EnergyPlus results and using it to set the boundary condition for CFD in OpenFOAM. Another capability of the tool is to support the design of very large buildings, such as a 127-storey building, the renovation of Berlin airport, or the renovation of a whole university campus of over 3000 rooms, and enable the import of different formats such as AutoCAD(DXF), STL,BIM(IFC), Sketchup(SKP), Obj, gbXML, and cityGML.

The programs and hardware that are currently linked to the BIM HVACTool are:



- the **EnergyPlus** building energy simulation program,
- the **OpenFOAM** and **Paraview** CFD simulation program,
- the **Radiance** ray-tracing software for lighting analysis,
- the OpenFOAM **FFire Solver,** a faster and more accurate fire simulation program,
- the **BIMServer**, which allows the exchange of large quantities of BIM data (.ifc),
- and **VR/MultiVR**, which allows virtual reality on site or even via an internet connection as a major advantage in distance learning.

What's new in BIM HVACTool 2.0

Thermal simulation

- A new solver, NANDRAD 1.5.1 is released, with the advantages:
  - Non-geometric multi-zone model and more sophisticated construction models (hygrothermal)
  - Good scalability, can handle large buildings over 1000 zones
  - Open connectivity to Modelica which can allow more accurate HVAC
- Supports EnergyPlus version 8.5

CFD simulation

- Supports OpenFOAM ver. 1712.

  We have updated OpenFOAM window version 1712, cooperating with Symscape, USA. The new function of the BIM HVACTool with the updated version of OpenFOAM provides:

  - Dynamic Mesh Support
  - Adaptive Mesh Refinements
  - Reactions Solver Support

Fire simulation

- We now have a new Ffire solver for OpenFOAM, cooperating with Rheologic GmbH. The main advantages of our new fire solver are as following :
  - Extremely short solution times, allowing overnight simulations and testing of many scenarios
  - Very good parallel speedup for huge cases
  - Support for complex geometry (non-rectangular) and arbitrary (polyhedral) meshes
  - Fully transient, measured (also arbitrary) heat release rates supported, from a smouldering piece of paper over a sofa up to an entire truck

- Multiple file locations within one simulation
- Support for radiative heat transfer including conjugate heat transfer
- Smoke extraction through ducts, vents and fans and Smoke visibility calculations
- Fuel agnostic - CO and soot release from conversion factors

Daylight simulation

- Supports Radiance 5.1 (BIM HVACTool Glare AddOn)

Shadow analysis

- Supports Shadow Analysis for the Korean market as well as Germany and Singapore

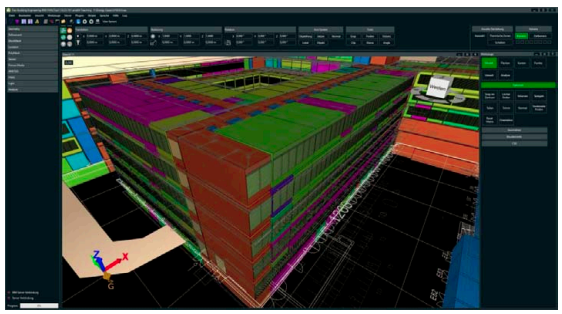
Green Mark certificate

- ETTV has been validated and accepted by BCA Singapore

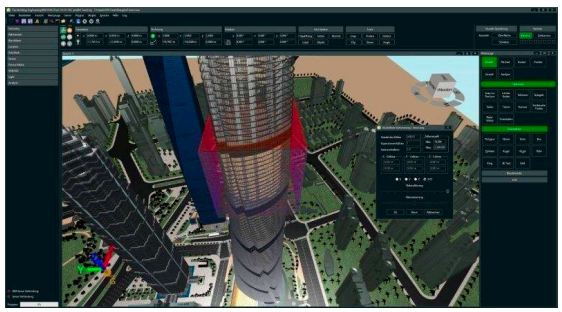
BIM Server

- Supports the latest version of BIM Server, 1.5.96

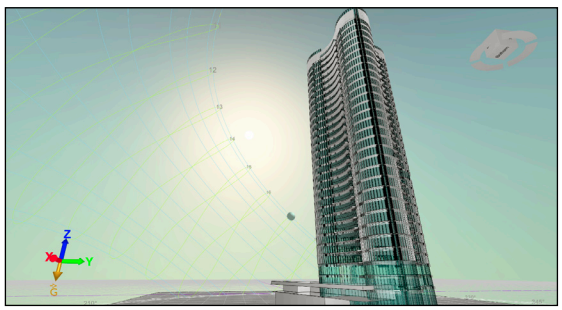
Example of thermal simulation by EnergyPlus solver

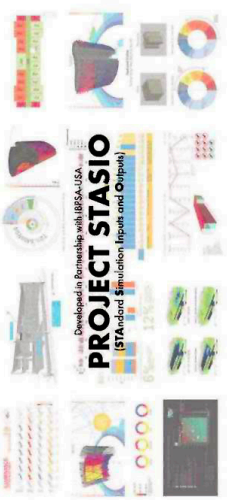


Example of CFD simulation by OpenFOAM solver



Example of daylighting in BIM HVACTool





Project StaSIO

Project teams often struggle to determine the method and best practices for communicating simulation results. Architects, being more visually oriented, prefer graphics for explaining simulation results, and engineers prefer working with numbers and spreadsheets. Project StaSIO strives to address this issue by facilitating improved communication between the design and engineering team.

Developed by IBPSA-USA's Research Committee, StaSIO is an online repository of crowd-sourced simulation graphics and case studies organized around the ASHRAE 209 framework. ASHRAE Standard 209 provides a framework on how to integrate energy modeling into the design process and Project StaSIO aims to provide supporting content on inputs, outputs, and case studies around the first three 'modeling cycles' defined by the standard which relate to early stage analysis like load reduction modeling and conceptual design modeling.

StaSIO approaches this issue by organizing energy modeling efforts according to targeted investigations questions broken down by energy modeling category. For instance, the 'Questions Menu' section on the Project StaSIO website identifies a sample set of questions, organized into common energy modeling categories like 'Lighting and Daylighting', 'Peak Load Reduction' etc. This sample set of questions provides ideas on how to frame a design problem that would be answered through an energy simulation exercise carried out by the energy modeler. It attempts to provide a better approach to framing questions, for example, instead of asking 'Do automated blinds save energy for this building', a designer could frame the question in a more targeted manner as 'What is the impact of different blind control strategies on illuminance over the course of an average day?'. **Figure 1** is an example graphic output addressing this question and **figure 2** (next page) is an example of a graphic output addressing the question of impact of glazing specifications on peak load and energy consumptions.

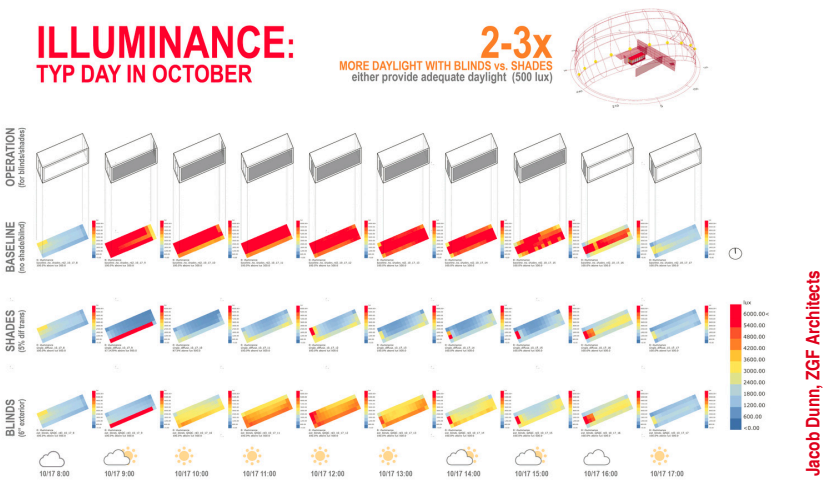
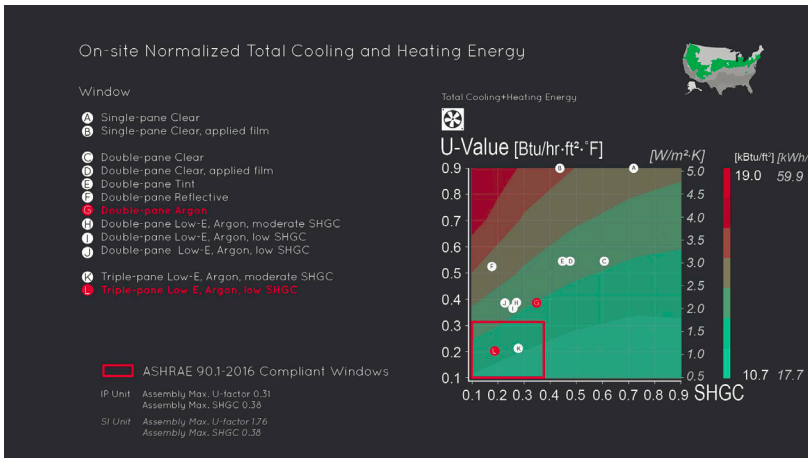


Figure 1



Rufei Wang, Harvard Graduate School of Design

Figure 2

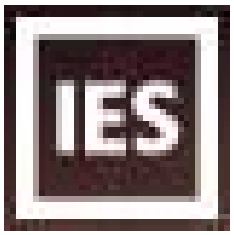
These graphics are excellent examples on how simulation results could be displayed to inform building design. Each example graphic on the website answers a question related to the design process and is supported by a narrative which explains how the graphic helped answer the question posed by the designer.

Project StaSIO aims to provide a diverse library of different types of outputs where the simulation community can learn from data visualization best practices and what insights they can provide in the design process. Increasing the ability to communicate simulation data to clients, to the design team, and to each other can add to the overall value of energy modeling. This effort can also start to suggest a standardization of certain types of graphics, including their outputs and inputs.

IBPSA-USA is organizing a competition in conjunction with the 2018 Building Performance Analysis Conference to catalyze crowd-sourced submissions to Project StaSIO. Through the competition, the StaSIO team hopes to have a website which serves as a resource for project teams all over the world looking for ways to better communicate simulation results and improve the decision making process at the early stage of design. There is more information about the competition in IBPSA-USA's report in the *News from affiliates* section of this *ibpsa*NEWS, page 60.

The members of the Project StaSIO team are:
Kjell Anderson, LMN Architects
Jacob Dunn, ZGF
Alejandra Menchaca, Thornton Tomasetti
Michael Sawford, EDSL
Supriya Goel, PNNL

There is much more information about the project on its website at **https://jacob-dunn-axra.squarespace.com**. ■



New IESVE Feature Pack approved for latest NCM update for UK Building Regulations Part L2

IES's latest VE 2017 Feature Pack 4 is now available to download from the IES Download Centre, **www.iesve.com/software/download**, with release notes at **www.iesve.com/software/download/IES VE 2017 Feature Pack 04 Release Notes.pdf**. This release incorporates the latest NCM update for Part L2 2013 November 2017, which is applicable to Part L2 2013, Section 6 2015 Scotland and Part L2 2014 Wales.

The changes in this SBEM v5.4.a.0 update affect a number of areas in the compliance framework and are applicable to both DSM and SBEM routes. These changes include:

- **Notional Building District Heating CO2 & Primary Energy Factor**
  Minimum threshold for District Heating CO2 Factor to be applied to Notional Building has been increased (Previously min threshold was 0.15 kgCO2/kWh, this is now 0.19 kgCO2/kWh).
- **Inference method lighting: LED inference**
  The inference data for LED lights has changed for buildings (other than those classed as portable modular), the luminaire lumens per circuit Watt has changed from 27.5 (side-lit) and 33 (top-lit) to 50 (for both side-lit and top-lit spaces).
- **Auxiliary Energy includes additional fan energy for heating systems with integral fans**
  Heating systems with integral fans are defined as *Central heating using water (convectors)* and *Other local room heater*. An additional fan energy is now added to Auxiliary Energy for these systems, this is specified by the user as an additional fan power (defined as W/kW heat output by the heating system). This additional energy consumption is added on to total Auxiliary Energy for the zones served by these systems.
- **HVACGUIDE-SFP for active chilled beams**
  When NCM System type is Active Chilled Beams and Air supply mechanism is *Centralised balanced A/C or Mech Vent system* a new code is written out for the BRUKL document, which means the system SFPs table will compare against a target 1.9 W/l/s.

Additional SBEM v5.4.a Improvements

In addition to the changes specified in the updated NCM Modelling Guide (**www.uk-ncm.org.uk/filelibrary/NCM_Modelling_Guide_2013_Edition_20November2017.pdf**), SBEM also includes the following two improvements:

- Calculation of lighting energy which now follows the NCM Activity Database specified lighting hours and not occupied hours as was previously used.
- Calculation of peak space cooling value used in fan power density calculation (for auxiliary energy determination) includes heat gains from display lighting which were previously excluded.

For technical help with this release, email **support@iesve.com**.

IES launches Martin Gough Student Award in memory of esteemed colleague

This year, IES has launched a global student award in memory of a colleague, Martin Gough, who sadly passed away last year. Martin, a longstanding employee and technical mastermind of IES, was very highly regarded by his colleagues and the simulation industry and will be sorely missed as an integral part of the company.

The Martin Gough Student Award will seek excellence in research based on Apache and thermal simulation, which was Martin's main area of expertise. Students from around the world are invited to take part, if they can answer yes to any of the following questions:

- Have you used ApacheSim or ApacheHVAC with novel building projects?
- Have you modelled innovative systems or renewables?
- Have you linked energy simulation output with external models or algorithms?
- Have you successfully calibrated models against reality?
- Have you modelled unique internal environments, factories, industrial processes?
- Have you brought new control approaches into energy simulation?
- Are you pushing the boundaries in energy research and modelling with IES VE?

Does this sound like you? If so, you could be in with a chance of winning the top prize of £1000 (or local currency equivalent), a full 12 month IESVE software licence and access to our distance learning portal for one year. One runner up will also receive a £500 cash prize, as well as an annual IESVE software and distance learning licence. Register your interest to let IES know if you intend to enter and in turn IES will keep you up to date with any news and developments around the award.

Final entries must be submitted by email to **award@iesve.com** by midnight on 30 June 2018. To find out more about the award, what makes for a winning entry and the submission requirements, please visit the IES website **www.iesve.com** or contact IES directly with any questions. ■

Using PHPP in Passive House design and certification

Peel School of Passive House, a provider of Passive House training courses, has announced a new online course on the use of PHPP in residential building design and certification. The course guides participants step-by-step through the relevant worksheets, while learning the correct conventions for measurements and calculations. Proper documentation is also covered in detail. A case study provides practical experience in completing and documenting PHPP calculations for building certification.

The course is the result of Peel School's long experience in designing training material on Passive House, and aims to impart knowledge and skills quickly and efficiently to both beginner and intermediate PHPPs users. Peel School expect people who have only completed one day of PHPP training to benefit greatly from participation.

Learning objectives include:

1. Learning the structure, inputs, and outputs of PHPP software
2. Selecting and inputting appropriate climate data sets in PHPP
3. Measuring and recording building characteristics (areas, volumes, etc.)
4. Specifying building assemblies and components
5. Modelling HVAC systems
6. Assessing building heat loss, energy demand and summertime overheating risk
7. Comparing Passive House and North American standards
8. Understanding proper sourcing of performance data
9. Gaining practical experience in completing a PHPP assessment for a residential development.

The course is structured into 4 sessions over the course of 2 months, each requiring about 5-8 hours of commitment. Participants are invited to complete sessions at their own pace, but recommended to keep a schedule of 2 weeks per session.

For further details and to register, visit **www.passivehousetraining.ca**. ■

IBPSA announcements

IBPSA Project 1: BIM/GIS and Modelica Framework for building and community energy system design and operation

Michael Wetter, Christoph van Treeck, Lieve Helsen, Darren Robinson and Dirk Saelens

IBPSA Project 1 Expert Meeting in Berlin

IBPSA Project 1 held its first Expert Meeting at the UdK Berlin on 27 and 28 February 2018, hosted by Christoph Nytsch-Geusen. The main focus of the meeting, attended by 60 people, was to organize the work within and the dependencies among the work packages. There was also a well received keynote by Hubertus Tummescheit, Chief Strategy Officer and co-founder of Modelon, about "The Adoption of MPC in the Power Industry – Lessons Learned and Ideas for the Buildings Industry".

While detailed plans may change during the 5 year project duration, it was agreed that the main priorities will be:

WP 1.1: Modelica Library for Design and Operation

The focus will be to develop a validated, well-documented Modelica library for the design and operation of building and district energy systems. This will be accomplished by further developing the library at **https://github.com/ibpsa/modelica-ibpsa**, by expanding its scope and documentation, and by restructuring it for easier use by non-experts.

The goal is to create a library that will serve as the basis of user-focused distributions of Modelica libraries for the building energy domain, in particular the libraries AixLib (RWTH Aachen), Buildings (LBNL), BuildingSystems (UdK Berlin) and IDEAS (KU Leuven) that use the IBPSA library as their core. Furthermore, a goal is that such libraries will be included in building energy simulation programs, including but not limited to EnergyPlus.

WP 1.2: Model Predictive Control

The focus of WP 1.2 is threefold. The first objective is to develop a Modelica library, possibly as a package of the IBPSA Modelica library, with models that can be used to efficiently solve optimal control problems for building and district energy systems within a Model Predictive Control (MPC) algorithm, and that can be combined with parameter and state estimation algorithms to adapt the models using measured data. The outcome will be an open-source, free Modelica library of component and system models for optimization, hosted on **https://github.com/ibpsa**. The second objective is to develop a common framework to test and assess MPC performance. This framework is a virtual test bed that represents a common architecture with detailed building emulator models that allow control by MPC. Both hydronic systems, that are more common in Europe, and air-based systems, that are more common in North America, are represented for different building types and complexities. The outcome will be an open source Building Optimization Test (BOPTEST) hosted on **https://github.com/ibpsa**. The third objective is to compare and benchmark different MPC formulations using the BOPTEST and selected performance indicators. The outcome will be a set of well-documented and tested MPC algorithms with their corresponding performances as benchmarked, and guidelines for good practice in MPC design.

WP 2.1 City District Information Modeling

The focus here is on improving the efficiency and reducing the uncertainty of urban energy simulation workflows. Key subtasks include: (i) international data mapping: defining the task-dependent data needs of urban energy simulation software, the existence and - for this is often different - availability of data, and strategies to plug the gaps between what is needed and what is available; (ii) international archetype mapping: defining country-specific domestic and non-domestic building archetypes and associated age bands, to support the semantic attribution of 3D models for urban energy simulation. Likewise, the development of classification techniques to automate the assignment of archetypes and age bands using geospatial data; (iii) parsimonious geometric processing: better understanding the appropriate level of geometric complexity needed for urban energy simulation purposes, and developing and deploying strategies to reduce geometric model complexity to these appropriate levels; (iv) parsimonious semantic enrichment: (semi-)automated workflows for the acquisition, sanitation and assignment of attributes to 3D models; (v) data exchange, using CityGML and its related application domain extensions (ADEs); and (vi) demonstration of the capabilities of urban energy simulation software.

WP 2.2 Building Information Modeling

Starting from the observation that geometry processing between BIM and BPS is a tedious and error-prone process lacking a robust method for space boundary and zone identification, this work package strives to develop advanced space boundary algorithms for BIM model topology analysis and multi-scale simulation model generation. In addition, the focus is on continuing the development of the modular BIM to BPS transformation toolchain from the IEA EBC Annex 60 for the HVAC domain. Likewise, and as a precondition, the developments will include joint work and coordination of a common BIM/HVAC classification scheme, well-linked to international standardization issues as well as the continuation of the IDM and MVD developments of the IEA EBC Annex 60.

WP 3.1 Application

The aim of this work package is to demonstrate through applications the capabilities that are enabled through Modelica. This will lead to the identification of specific research needs that are subsequently communicated to the researchers active in Tasks 1 and 2. The approach is to share best approaches and document them for dissemination to the community. The outcome of this Work Package is a collection of case studies that demonstrate capabilities enabled by use of Modelica for building and district energy system design and operation.

WP 3.2 District energy DESTEST

The second work package within Task 3 includes the development of a validation test for district energy models that started in IEA EBC Annex 60: DESTEST. During the Berlin meeting, it was agreed to define a first common exercise that simulates the behavior of a simple thermal network in a simple neighborhood. This example will serve as a first test and will progressively be made more complex to analyze research questions related to the simulation of district energy systems. The outcome of this work package is the description of a set of representative districts that can be used for testing different DES models or testing different DES implementations and approaches (for example, central versus distributed storage) as well as a validation test procedure for district energy system models.

The next meeting will be in fall in Paris, organized by Lisa Rivalin and Valentin Gavan of Engie.

For more information about the project, visit **https://ibpsa.github.io/project1/index.html**.

IBPSA Project 2: Accredited Building Modeller Scheme

Lori McElroy, IBPSA Vice President

Through the IBPSA Projects Committee we have set up a project to develop an IBPSA Accredited Energy Modeller Scheme. This is the second project approved through the IBPSA Projects Team and IBPSA would welcome more ideas of this type. If you would like to propose such a project — or know more about Projects 1 & 2 — please contact the Chair of the Projects Committee Matthias Haase at **Matthias.Haase@sintef.no**.

The use of Building Energy Modelling tools has grown exponentially in recent years, particularly within industry. Despite this there are no universally recognised QA or Accreditation requirements placed on those using modelling software. The need for these procedures is reinforced by upcoming legislation and standards worldwide - in the UK for example, there is the imperative linked with the recent introduction of a Government target of BIM Level 2 compliance for all public sector procurement by 2016 – similar legislation is coming into force elsewhere in the world.

There has been a considerable amount of discussion at IBPSA Board level around cementing IBPSA's position as the lead organisation promoting and supporting the use and development of simulation tools in practice and if IBPSA wishes to position itself as the worldwide authority on building simulation and modelling it seems only natural that IBPSA should be at the forefront of the development of an Energy Modelling Accreditation scheme. Although schemes exist in other individual countries and organisations, (such as the ASHRAE BEMP scheme and CIBSE's TM11 – Building Performance Modelling (2015)) an IBPSA scheme would be truly international in that the intention is to develop a flexible, generic scheme that allows scope for the incorporation of local / national building nuances and tools / models where appropriate.

The details have yet to be finalised but the intention is that modellers could be accredited in one or more tools through the scheme and for consistency, tool providers would deliver an (IBPSA) agreed standard of training, independently verified and covering an agreed range of issues. The potential to achieve 'basic', 'intermediate' or 'expert' status could be explored at a later stage. The purpose of the project is to assist building professionals to deliver consistency and to assure clients of the quality of modelling work undertaken on their behalf.

From a client's perspective, the **purpose** of the scheme is to provide a level of reassurance for those commissioning a simulation model of their building in terms of consistency of approach and understanding of the issues thus instilling confidence in the implementation of recommendations based on simulation predictions. From a modeller's perspective, having such accreditation:

- demonstrates competency in critical energy modelling knowledge, skills and capabilities;
- elevates your reputation among peers, in the workplace and among clients;
- provides competencies in your ability to advise on compliance with local, regional and national regulation and policy;
- provides the missing link between compliance tools and design development tools.

The members of the **Project Board** appointed by the IBPSA Board to ensure that the project meets IBPSA objectives are Dru Crawley, Wim Plokker and Paul Bannister. The members of the **Projects Team** are Matthias Haase, Jon Hand and Raymond Stirling.

We will be contacting the membership to gather views and test out some of our ideas in the near future. ■

Call for nominations for IBPSA Board of Directors

As specified by the IBPSA by-laws, an election is held each year for half of the Board of Directors membership. The Board consists of 10 At-Large Directors plus one Affiliate Director from each region. Any member can nominate a candidate for an At-Large seat. Five At-Large Directors will be elected during balloting in June and July. The official call for nominations will be circulated in early May.

If you have questions about nominating or being a candidate, you are encouraged to contact Lori McElroy at **Lori.McElroy@bre.co.uk** .

The new board will be seated at the Annual General Meeting to be held in Rome on 7 September 2018 ■

Call for nominations for IBPSA Awards

The Board of Directors of IBPSA is seeking nominations for Awards to be presented at Building Simulation 2019, in Rome, Italy (2-4 September 2019). IBPSA makes three awards for outstanding work in the building performance simulation field. These awards are made on a biennial basis at each Building Simulation Conference, providing there is a qualified candidate. The three categories awarded are:

IBPSA Distinguished Achievement Award

This award, formerly named the IBPSA Award for Distinguished Service to Building Simulation, recognizes an individual who has a distinguished record of contributions to the field of building performance simulation, over a long period.

IBPSA Outstanding Young Contributor Award

This award recognizes an individual at the beginning of their career who has demonstrated potential for significant contributions to the field of building performance simulation.

IBPSA Innovative Application Award

This award, formerly named the IBPSA Award for Distinguished Practice, recognizes an individual, group or firm, who has made a significant contribution to the effective application and/or advancement of building performance simulation in practice. The award may be given for a unique or noteworthy use of simulation in practice; development of simulation software or supporting software that has had a significant impact on industry practice; or other contribution that has advanced building performance simulation in practice.

Nominations

Nominations for awards must be made by an independent third party. They must be submitted via email to the Chair of the Awards and Fellows Committee, Michaël Kummert, at **michael.kummert@polymtl.ca**. The deadline for nominations is 30 November 2018. We would like as many nominations as possible, so please contact Michaël Kummert to discuss a possible nomination if required.

Details of nomination packages and a list of recent past recipients of these awards can be found on the IPBSA website at **www.ibpsa.org/?page_id=62** ■

Call for nominations for Fellows of IBPSA

The Board of Directors of IBPSA is seeking nominations for the 2019 class of Fellows. The IBPSA membership grade of Fellow recognizes individuals who are:

> "A member who has attained distinction in the field of building performance simulation, or in the allied arts or sciences, or in teaching of major courses in said arts and sciences, or who by way of research, simulation code development, original work, or application of building simulation on projects of a significant scope, has made substantial contribution to said arts and sciences, and has been active in the field for at least ten (10) years".

The IBPSA Board of Directors elects new Fellows on a two-year cycle, culminating with recognition at the biennial Building Simulation conferences.

Nominations

Nominations may be made by IBPSA members other than the nominee. They must be submitted via email to the Chair of the Awards and Fellows Committee, Michaël Kummert, at **michael.kummert@polymtl.ca**. The deadline for nominations is October 31, 2018. We would like as many nominations as possible, so please contact Michaël Kummert to discuss a possible nomination if required.

Nominations should include details of the nominee's accomplishments in one or more of the following categories: industrial leadership, research, simulation code development, application of building simulation on projects of significant scope, educational leadership, and significant technical contributions to the allied arts and sciences. Details of nomination packages and a list of IBPSA fellows can be found on the IPBSA website at **www.ibpsa.org/?page_id=310** ■

Student Travel Awards – supporting students to attend BS2019

Travel to IBPSA Conferences can be an expensive business – especially for students. In order to assist as many students as possible to participate in Building Simulation 2019 in Rome, Italy, IBPSA will grant a number of travel awards of up to $1,000 (US) to students presenting peer-reviewed papers. Student travel awards are limited to a maximum of 5 grants per biennial conference and are therefore highly competitive.

The selection committee bases its decisions upon the following selection criteria:

- need for financial assistance, evidenced in a letter of recommendation from the student's supervisor/ advisor of studies (must be on university letterhead);
- overall quality of the peer-reviewed paper;
- relevance of contribution to the field of and/or furthering the effective application of building simulation.

To be eligible, the student must be:

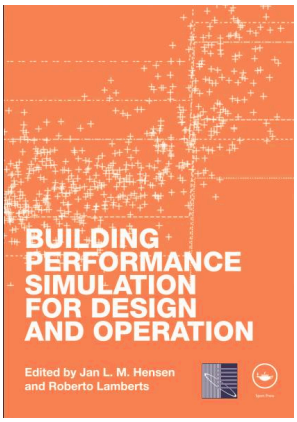
- enrolled in a graduate program related to building simulation at the time of the conference; and
- the thesis project must be directly related to building simulation.

Applications

Applications must be submitted via email to the Chair of the Awards and Fellows Committee, Michaël Kummert, at **michael.kummert@polymtl.ca**. The deadline for applications will be aligned with the deadline to submit full papers at the conference, and is expected to be around mid-January 2019.

Details of applications can be found on the IPBSA website at **www.ibpsa.org/?page_id=62** ■

Building Performance Simulation for Design and Operation



Jan L.M. Hensen and **Roberto Lamberts**

Effective building performance simulation can reduce the environmental impact of the built environment, improve indoor quality and productivity, and facilitate future innovation and technological progress in construction. It draws on many disciplines, including physics, mathematics, material science, biophysics and human behavioural, environmental and computational sciences. The discipline itself is continuously evolving and maturing, and improvements in model robustness and fidelity are constantly being made. This has sparked a new agenda focusing on the effectiveness of simulation in building life-cycle processes.

Building Performance Simulation for Design and Operation begins with an introduction to the concepts of performance indicators and targets, followed by a discussion on the role of building simulation in performance-based building design and operation. This sets the ground for in-depth discussion of performance prediction for energy demand, indoor environmental quality (including thermal, visual, indoor air quality and moisture phenomena), HVAC and renewable system performance, urban level modelling, building operational optimization and automation.

Produced in cooperation with the International Building Performance Simulation Association (IBPSA), and featuring contributions from fourteen internationally recognised experts in this field, this book provides a unique and comprehensive overview of building performance simulation for the complete building life-cycle from conception to demolition. It is primarily intended for advanced students in building services engineering, and in architectural, environmental or mechanical engineering; and will be useful for building and systems designers and operators.

Selected Table of Contents

1. The Role of Simulation in Performance Based Building 2. Weather Data for Building Performance Simulation 3. People in Building Performance Simulation 4. Thermal Load and Energy Performance Prediction 5. Ventilation Performance Prediction 6. Indoor Thermal Quality Performance Prediction 7. Room Acoustics Performance Prediction 8. Daylight Performance Predictions 9. Moisture Phenomena in Whole Building Performance Prediction 10. HVAC Systems Performance Prediction 11. Micro-cogeneration System Performance Prediction 12. Building Simulation for Practical Operational Optimization 13. Building Simulation in Building Automation Systems 14. Integrated Resource Flow Modelling of the Urban Built Environment 15. Building Simulation for Policy Support 16. A View on Future Building System Modelling and Simulation

January 2011 |536pp | Hb: 978-0-415-47414-6 | £65.00

About the Authors

Jan L. M. Hensen *(Ph.D. & M.S., Eindhoven University of Technology) has his background in building physics and mechanical engineering. His professional interest is performance-based design in the interdisciplinary area of building physics, indoor environment and building systems. His teaching and research focuses on the development and application of computational building performance modelling and simulation for high performance.*

Roberto Lamberts *is a Professor in Construction at the Department of Civil Engineering of the Federal University of Santa Catarina, Brazil. He is also currently a board member of the IBPSA, Vice-President of the Brazilian Session and Counsellor of the Brazilian Council for Sustainable Buildings.*

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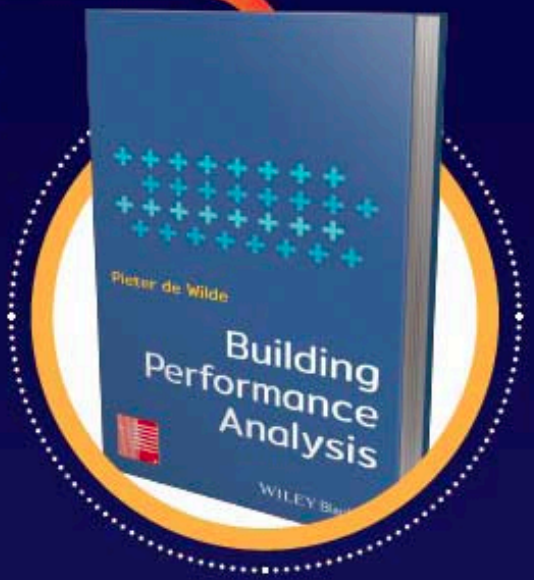
Building Performance Analysis

Pieter de Wilde

Improved building performance is a key goal for all building owners, be it energy efficiency, indoor air quality, productivity or user comfort. In the context of increasingly scarce resources, these aims place significant demands on the design, construction and operation of new and existing buildings. With the emergence of big data and corresponding analysis techniques, building owners and operators will have access to huge amounts of information, yet the performance gap between predictions (by simulation and extrapolation of data) and measurements remains significant.



The purpose of *Building Performance Analysis* is to explore and bring together the existent body of knowledge on building performance analysis. In doing so, it provides a working definition of building performance, and an in-depth discussion of the role building performance plays throughout the building life cycle. It explores the perspectives of various stakeholders, the functions of buildings, performance requirements, performance quantification (both predicted and measured), criteria for success, and performance analysis. Driving this discussion are the following questions:

- What is building performance?
- How can building performance be measured and analyzed?
- How does the analysis of building performance guide the improvement of buildings?
- What can the building domain learn from the way performance is handled in other disciplines?

In answering these questions the book makes a major contribution to the application of building performance concepts in the operation and management of high performance buildings.

ISBN: 9781119341925
To be published in April 2018

Explores and brings together the existent body of knowledge on building performance analysis

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News from IBPSA affiliates

IBPSA affiliates are asked to submit a report to the IBPSA Board each year to keep Board members informed about their activities and membership. These are too detailed to include in ibpsaNEWS, so affiliates have been asked to make their latest annual report available through their web sites, and this section includes only selected, recent news. Other news from affiliates may be available from their websites; the URLs for these are available on the IBPSA Central web site at www.ibpsa.org/?page_id=29.

IBPSA-France

Past activities

IBPSA-France organised a two day workshop on 26-27 June 2017, hosted by INSA Lyon's CETHIL laboratory.

Three round-table sessions on the first day covered:

- Interoperability of simulation tools to share and progress from lessons learnt at the GENSIM school,
- Inverse numerical methods covering calibration, optimisation and sensitivity analysis, and
- LCA progress related to building simulation.

The second day was a whole day training session on MODELICA open to all participants. This was a great success and attracted a large audience of both students and professionals.

Activities for the next 12 months

The next biennial IBPSA-France congress will take place on 15-16 May 2018 in Bordeaux, hosted by Institut de Mécanique et d'Ingénierie of Bordeaux (I2M) and the Energy Transition Institute Nobatek / INEF4. The main theme of the conference is guaranteeing the energy performance of buildings. Paper submission is now closed and reviewing is in progress. For more information please visit **http://conference2018.ibpsa.fr/.**

The next Sustainable Places (SP2018) conference will take place on 27-29 June 2018, at Aix les Bains in France. SP2018 is being organised by INES, University of Savoie-Mont Blanc, CEA and R2M under the aegis of IBPSA-France. SP2018 is a forum on scientific and technological innovations for the management of digital construction and renewables integration, applied to Energy-efficient Buildings (EeB), local communities, intelligent districts, and secure power grids.

For more information please visit the SP2018 website, **www.sustainableplaces.eu/ .** ■

IBPSA-India

2017 was an active year for IBPSA-India: **www.ibpsaindia.org** went live, providing information on events and an online booking facility; two successful events were held, in September and December; and the Board of Directors met three times and agreed a programme of future activities and a way ahead.

One-day workshop on Lighting Simulation for Visual Comfort & Energy Efficiency

The Indian Green Building Council (IGBC) and International Building Performance Simulation Association (IBPSA) India organized a joint workshop on lighting simulation during the 15th Green Building Congress in Jaipur on 4 October 2017. This attracted more than thirty building professionals, architects, engineers, consultants, manufacturers, and academics as participants.

The workshop offered hands-on experience on daylighting and artificial lighting simulation software for examining visual comfort (3D-visualization) and lighting energy efficiency through optimum window area, reduction of Lighting Power Density (LPD) and understanding simulation reports. The event was led by Vishal Garg, founder President of IBPSA-India, with the support of other members. More details are available at **www.ibpsaindia.org/events/daylighting2017/** .

Analysis of Uncertainty in Building Design Simulation: a talk by Godfried Augenbroe, Georgia Tech University, USA

On 18 December IBPSA-India hosted a talk by Professor Godfried Augenbroe on *Analysis of Uncertainty in Building Design Simulation* at Malaviya National Institute of Technology, Jaipur, and made it available across the country through its first live webcast. More than 40 academics, students and industrialists attended. Professor Augenbroe highlighted the uncertainties inherent in building performance simulation and suggested that to reduce the gap between predicted and actual energy performance modellers should first address parameter uncertainties, and then scenario uncertainties. Professor Jyotirmay Mathur, President of IBPSA-India, moderated the event. A summary of the talk can be found at **www.ibpsaindia.org/uncertaintysummary/**.

During his visit Professor Godfried also visited experimental facilities and met staff and students at the Institute. ■

IBPSA-Ireland

ASHRAE Ireland Chapter & IBPSA-Ireland will jointly host a Research Symposium on Building Performance Analysis at Trinity College Dublin on 28-29 May 2018. The overall aim of the symposium is to bring together graduate students and researchers from Irish third-level institutions who are engaged in research related to analysis and simulation of the built environment. Given the diversity of ongoing research, the symposium will act as a unique forum to highlight both the breadth and depth of activity in the building performance analysis arena, as well as providing an opportunity for researchers to share their experiences. The invited keynote speakers will be Professor Vincenzo Bianco, University of Genoa and Professor Dimitrios Rovas from University College London. ■

IBPSA-Nordic

IBPSA-Nordic held three successful events during 2017:

Building performance simulation for adaptive and interactive buildings at the passivhus Norden conference, 27-29 September 2017, Helsinki, Finland

Improving the indoor climate and energy performance of buildings will require dedicated decision making tools. Several of these are under development to help building designers/owners/clients decide what performance levels to aim for, and to check performance in terms of energy, comfort and expected costs. The September workshop aimed to give an overview both of the tools available now and of recent developments in the field.

Around 20 participants discussed research results from various simulation case studies and from measurements of actual building performance. There was also a lively discussion amongst simulation experts, designers and facility management experts on likely future challenges for district and urban level performance simulations.

Workshop on building performance simulation for advanced users of IDA ICE, 23-24 October 2017, Trondheim, Norway

This workshop aimed to give IDA ICE users hands-on help, tips & tricks, and news about the latest developments in the tool. It was designed to be most useful for PhD and Masters students. In the workshop:

- some research studies from participants were discussed in detail
- feedback about modelling approaches, tips & tricks were explained
- advanced features of IDA ICE v4.8 were demonstrated and hands-on help offered on actual issues
- future challenges for performance simulation using IDA ICE v4.8 were discussed.

Organized by SINTEF Building and Infrastructure, the workshop attracted 15 participants from SINTEF and NTNU. It was well received by the audience and the majority expressed interest in repeating the seminar in six months.

Seminar on the practical use of simulation tools for calculation of energy and indoor climate in buildings, 1-2 November 2017

This seminar was organised jointly by IBPSA-Nordic and Norsk VVS Energi og Miljøteknisk Forening to promote wider knowledge and practical use of simulation as a means of improving the energy, environment and financial performance of buildings and their technical systems. Lecturers were selected to include a mix of experienced modellers from both educational and research institutions, and from industry.

The event was held principally in Norwegian, with some lectures given in English, and attracted a total of 51 participants, including 23 who followed the webinar online. It was well received by the audience and the majority plan to come back to a similar event planned for 2018.

A few comments from the audience:

> *".. Very good to have both researchers' and consultants' perspectives ... The approach to the problem is different due to time and need for documentation ... There could have been even more focus on the consultants' perspective ..."* ■

IBPSA-Switzerland

Achim Geissler

2018 has begun in the same way as 2017 ended: rather difficult for IBPSA-CH. Our partnership with "bauen digital schweiz" ("Building Digital Switzerland") continues, but has not yet led to any notable collaboration. We are looking for ways to change this. Members themselves are sadly unable to take forward any activities due to work load.

IBPSA-CH will be a scientific partner of the "Brenet Status-Seminar" being held at ETH in Zürich in September. Currently, submitted papers are being evaluated by the scientific committee, which includes representation from IBPSA. It has not yet been decided whether there will be a dedicated IBPSA-CH session at the conference. More information about the seminar is available at **www.brenet.ch/status-seminar/** (in German).

Our membership count has seen a slight decrease to a bit below 60 members. We are still hopeful that this number will increase – initiation of some activities in the near future would likely help. ■

IBPSA-Turkey

IBPSA-Turkey now re-established under TTMD umbrella!

Since August 2017, great efforts have been made to re-establish IBPSA-Turkey under the aegis of the Turkish Society of HVAC and Sanitary Engineers (TTMD). TTMD has around 3000 professional members including designers, representatives, manufacturers, practitioners and academics, and is a member of ASHRAE, REHVA and CLIMAMED. As a first step in the cooperation between TTMD and IBPSA, a meeting was held on 21 October 2017, hosted by TTMD at the Latanya Hotel in Ankara. This was attended by Directors of TTMD Professor Birol Kılkış, Tuba Bingol Altiok, Kemal Gani Bayraktar, Gokhan Unlu and Kemal Gokay, and by Professors Figen Beyhan, Mehmet Caliskan and Zerrin Yılmaz, Associate Professors Arzuhan Burcu Gultekin, Gulsu Ulukavak Harputlugil, Idil Aycam and Zeki Yılmazoglu, Assistant Professor Semra Arslan Selcuk, and Busra Hepguzel Acikyol, Ece Kalaycioglu, Alpay Akguc, Can Gunturkun, Cihan Kayhan, Efe Unal, Erol Ergezen, Gokhan Tatlidede, Guher Kavci, Ozgur Ozturk, Serhat Seyar, and Sinan Soganci.

Following the election of board members and the regional representative on 17 November, there were several other meetings — one of which was attended by Professor Pieter De Wilde (Plymouth University, UK, IBPSA Secretary) — to build a general framework for the establishment of IBPSA-Turkey. Finally, in January 2018, the application procedures were completed and the IBPSA-board officially accepted IBPSA-Turkey.

IBPSA-Turkey will work as a Committee of TTMD, and members of IBPSA-Turkey will be members of TTMD. The Committee, led by the Board, is independent in its activities apart from the financial situation. The budget for each activity year will need approval from the TTMD administrative board.

IBPSA-Turkey's main gateway will be **http://ibpsa-turkey.ttmd.org.tr**.

A launch event will be held in spring 2018 at the TTMD International Conference in Istanbul (**www.ttmd.org.tr/2018sempozyum/eng/**). This will be a half-day seminar/ information event focusing on contemporary research in building simulation. One of the keynote speakers at the seminar session will be Chip Barnaby, IBPSA President.

In addition to national events IBPSA-Turkey intends to hold regional events focusing on local issues and bringing together those active in simulation at a local level. Several short term and long term activities are planned to this end including weekend seminars, life-long learning courses, contribution to national and international projects and contribution to the development of National Laws and Regulations.

The current Board members of IBPSA-Turkey are:

Chair and Affiliate Representative:

Gulsu Ulukavak Harputlugil, Associate Professor of Architecture, Çankaya University, Ankara, **gharputlugil@cankaya.edu.tr**
Please feel free to contact him for any further information about IBPSA-Turkey.

Vice-Chair:

Sinan Soganci
CAE Team Leader, Akana Engineering, Ankara

Vice-Chair and previous Chair:

Meltem Bayraktar
Urban Efficiency & Climate Manager, WRI Turkey Sustainable Cities, Istanbul

Secretary:

Nese Ganiç Saglam
Instructor at Faculty of Architecture and Design, Ozyegin University, Istanbul

Treasurer:

Ece Kalaycioglu
Instructor at Faculty of Architecture and Design, Ozyegin University, Istanbul

Committee Members:

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Efe Unal
Project and R&D Manager, AironnVentilation, Istanbul

Gökhan Unlu (TTMD board observer member)
Partner, Ünlü Engineering, Ankara ■

IBPSA-USA

Winter Meeting in Chicago

More than 90 fans of building performance simulation made their way through the menswear department and up to the seventh floor of Macy's in downtown Chicago for the IBPSA-USA Winter Meeting, on 20 January 2018 (**www.ibpsa.us/ibpsa-usa-2018-winter-meeting-chicago**).

The evening started with a presentation by Paul Erickson, Fred Betz and Sagar Rao of Affiliated Engineers, Inc (**www.aeieng.com/index.php/home**). They shared an interesting approach they developed to help them more efficiently employ simulation throughout the design process. Due to popular demand, they may be talked into delivering the presentation again in the form of a webinar so that more IBPSA-USA folks can benefit from their experience. Attendees also heard brief reports from four event Gold Sponsors: Tony Saracino of Autodesk (**www.autodesk.com**), Drew Morrison of Seventhwave (**www.seventhwave.org**) for ComEd (**www.comed.com/Pages/default.aspx**), Oliver Baumann of Bauman Consulting (**http://baumann-us.com**), and Ken Griffin of ESD (**www.esdglobal.com**).

During happy hour, the Macy's Narcissus room echoed with joyous IBPSA conversation. For some attendees, this cozy interlude was clearly the high point of their visit to Chicago.

Not to be outdone by happy hour, Benny Skelton of Cyclone Energy (**www.cyclone.energy**) entertained the dinner crowd and shared lessons learned while modeling during the design of a net zero energy Walgreen's store.

Finally as attendees filtered out and set sights on the June meeting in Houston, some were disappointed to find that Macy's had closed for the night and to realize they would need to wait until morning to pick up a fresh pair of boxer shorts.

Learn more and register for our upcoming Summer Meeting in Houston at **www.eventbrite.com/e/2018-summer-meeting-in-houston-ibpsa-usa-tickets-43616576354**. Early-bird tickets now on sale.

There are more photos on the IBPSA-USA website, **www.ibpsa.us/news/ibpsa-usa-winter-meeting-chicago-report**.

Updates on 2018 Building Performance Analysis Conference and SimBuild, co-organized by ASHRAE and IBPSA-USA

The 2018 Building Performance Analysis Conference and SimBuild, co-organized by ASHRAE and IBPSA-USA, will be held on 26-28 September 2018 in Chicago, Illinois. It is the third co-organized conference between ASHRAE and IBPSA-USA. A record number of 174 draft papers are now entering the double-blind review phase. We received more completed papers than in 2014 and 2016 combined!

About 100 presentation proposals have also been received, and this is almost twice the number of submissions received in the past. Several interesting new research topics have been proposed including city scale modeling using AutoBEM, and machine learning for demand response and building energy management. This year's

presentation proposals also have a few innovative presentation formats with more than 30 team case studies and 10 TEDergy talks, which will provide a more interactive and engaging forum for the attendees. For more information, visit **www.ashrae.org/conferences/specialty-conferences/2018-building-performance-analysis-conference-and-simbuild**.

The 4th Annual Lowdown Showdown has also been announced — see **www.ibpsa.us/news/4th-annual-ashrae-lowdown-showdown-competition-announced**.

Announcing the Project StaSIO Competition

Project StaSIO (Standard Simulation Inputs and Outputs) was created through work completed by the IBPSA Architectural Simulations Subcommittee. It is an online website (**https://jacob-dunn-axra.squarespace.com**) populated with crowd-sourced simulation graphics and case studies organized around the ASHRAE 209 framework. There is more information about the project in the *Software news* section of this *ibpsa*NEWS, page 41.

The objective of the competition is to catalyze crowd-sourced submissions to Project StaSIO through execution of an online competition for Project StaSIO's two forms of submissions: 1) Graphic Outputs and 2) Case Studies. The competition is open to organizations or individuals who want to submit through either of the paths. Finalists will be presented at the 2018 Building Performance Analysis Conference and SimBuild co-organized by ASHRAE and IBPSA-USA.

Learn more about how to enter by reviewing the competition guidelines at **www.ibpsa.us/project-stasio-competition**. ■

IBPSA affiliates

See the IBPSA Central web site at http://www.ibpsa.org/?page_id=29 for details of affiliate websites and contacts. Affiliate representatives are voting members of the IBPSA Board except where marked *.

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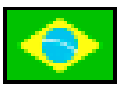
contact: **Quentin Jackson**



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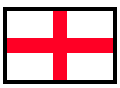

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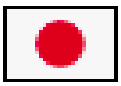

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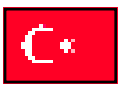

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For additional information about IBPSA, please visit the Association's web site at **www.ibpsa.org**. For information on joining, contact your nearest regional affiliate.

IBPSA's mailing list has been consolidated into another listserver known as BLDG-SIM, which is a mailing list for users of building energy simulation programs worldwide, including weather data and other software support resources. To **subscribe** to BLDG-SIM, to unsubscribe or to change your subscriber details, use the online forms at **http://lists.onebuilding.org/listinfo.cgi/bldg-sim-onebuilding.org**.

To post a message to all members, send email to **bldg-sim@lists.onebuilding.org**.

The BLDG-SIM list is provided by GARD Analytics. If you have any questions, please contact the list owner Jason Glazer at **jglazer@gard.com** or +1 847 698 5686. ■

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